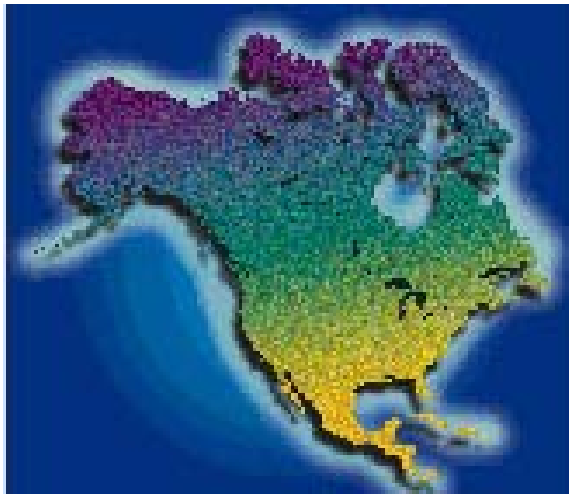


LandView[®] 5

Tutorial

Created: June 2002

Updated: August 15, 2002



U.S. Census Bureau

U.S. Environmental Protection Agency

U.S. Geological Survey

National Oceanic and Atmospheric Administration

The LandView 5 Tutorial

Introduction

The LandView[®] 5 Tutorial provides instructions for accessing the LandView 5 databases, for using the MARPLOT[®] mapping application and for performing basic navigational tasks. It is meant to be used in conjunction with the LandView 5 installation for *Prince William County, Virginia*¹, available from the installation CD/DVD. However, the Tutorial text file continues to be available for reference within your working copy of LandView 5 after you have completed the Tutorial. Prince William County may not be among the map and data sets that are available on your working copy, but the material can be applied out of context.

Additional LandView/MARPLOT usage information is available from the **LandView Help** and the **MARPLOT Help** files. The Documentation directory on the installation CD/DVD provides further information. Included there are a **MARPLOT User's Manual**, a **MARPLOT Technical Documentation** manual and a complete printout of the **LandView Help** files, all as Adobe Acrobat Portable Document Format (PDF) files. You should also check the LandView web site for updated versions of these materials <http://landview.census.gov>.

What is LandView 5?

LandView 5 contains both database management software and mapping software that displays:

- Census 2000 demographic data from the U.S. Census Bureau
- MARPLOT maps based on Census 2000 TIGER/Line[®] files
- EPA-regulated site locations and information
- The U.S. Geological Survey's Geographic Names Information System (GNIS). The GNIS contains geographic names for all known places, features, and areas in the United States that are identified by a proper name

This information is presented in a geographic context that includes:

- Jurisdictional entities (states, counties, cities & towns, and congressional districts) and other statistical entities of the U.S. Census Bureau
- Detailed topological network of major and minor roads, rivers, and railroads
- Census 2000 block points, block groups and census tracts
- Selected feature names from 1:24,000-scale U.S. Geological Survey (USGS) topographic maps.

¹ LandView is compatible with CAMEO[®], an emergency planning and response software. Prince William County was chosen as the demonstration county in the LandView Tutorial to be compatible with the many illustrative examples developed for CAMEO software users since the introduction of CAMEO DOS in 1990. For further information about CAMEO software go to <http://www.epa.gov/ceppo/cameo/>.

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Demographic and geographic information are integrated and are accessible through software that provides:

- Desktop mapping capabilities for displaying, searching, and identifying map objects
- Thematic mapping capabilities—choosing display attributes based on database information
- Calculation of Census 2000 population and housing unit counts within a user-defined radius
- Printed maps and reports

Background Information

LandView 5 has its roots in the CAMEO (for Computer-Aided Management of Emergency Operations) program of emergency planning and response software. CAMEO was developed by the Environmental Protection Agency (USEPA) and the National Oceanic and Atmospheric Administration (NOAA) to facilitate the implementation of the Emergency Planning and Community Right-to-Know Act (EPCRA, sometimes referred to as SARA Title III—for Title III of the Superfund Amendment and Reorganization Act of 1986). This is a far-reaching law requiring that communities develop emergency response plans to address chemical hazards, and to make information on chemical hazards in the community available to the public.

Mapping Systems, Spatial Information, and Layers

The LandView 5 product contains two software programs—the LandView 5 data viewer and the MARPLOT map viewer. These two programs work together to create a simple mapping system that will associate data records in LandView with their corresponding map objects displayed in MARPLOT .

For example, the LandView 5 USEPA **ENVIROFACTS** database shows information for a database of EPA regulated sites, while the location of each site is stored in an individual MARPLOT map layer.

MARPLOT allows the user to access all or some of the stored spatial information. Layers can be shown or hidden to tailor the displayed objects to a user's needs. For example, if only the EPA layer is shown, a user will only see EPA objects displayed. However, without other layers in view, there is no context to see which roads or rivers or cities are nearby. By showing these relevant layers, a user can create a map that displays the EPA layer relative to roads, rivers and cities. One analogy frequently used to describe the **layer** concept is that layers can be thought of as a series of transparent sheets that are overlaid one on top of the other, so that each layer is visible either above or below the others. The power of the MARPLOT software lies in the user's ability to customize the map view to display only layers of interest, as well as specify the desired scale for the map view, and then use LandView 5 to get information about the map objects.

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For more detailed information regarding the LandView 5 databases, please go to **The LandView Databases** section of LandView Help. There you will find descriptions of the Census, EPA, and USGS databases plus links to each agency's Internet site.

Notes for Users of the CAMEO Program

The CAMEO suite of programs include CAMEOfm—its current release, ALOHA and a freestanding version of MARPLOT . As LandView has a ‘sharing’ relationship with its included MARPLOT application, the CAMEO applications have a sharing relationship with the freestanding MARPLOT . For the CAMEO suite to interact with LandView, it must use the version of MARPLOT used by LandView. The following explains how.

1. If CAMEO is presently accessing a version of MARPLOT other than that in LandView 5 (i.e., the freestanding MARPLOT or a previous version of LandView), the version must be hidden from CAMEO. This can be done by temporarily changing the name of the containing directory or temporarily hiding the directory inside of another directory.
2. In CAMEO, use **Sharing/Go to MARPLOT** . You will be asked, in a browse screen, to locate MARPLOT . Navigate to MARPLOT in the default directory, *c:\lv5²*. Confirm the linkage by using **Sharing/Go to CAMEO** to return to CAMEO. A similar procedure should be used to establish the ALOHA linkage.
3. CAMEO map objects are contained in CAMEO map nested in the CAMEO directory, and this data is immediately available to the new MARPLOT . If the older version of MARPLOT contains other data, this will need to be transferred to the newer MARPLOT . The User’s Map folder should replace the User’s Map in *c:\lv5*. If other map directories are nested in the older MARPLOT , these should be copied and pasted to *c:\lv5*. After all usable data has been extracted, if the older MARPLOT serves no useful purpose, it should be deleted.

Organization of the Tutorial

- Lesson 1—Starting LandView and MARPLOT
- Lesson 2—Exploring the LandView 5 databases
- Lesson 3—Navigating in MARPLOT
- Lesson 4—Interacting LandView and MARPLOT
- Lesson 5—Population and other searches at a radius around a point
- Lesson 6—Using other search methodologies

² The default directory for the LandView Demo is *c:\lv5_demo*. CAMEO can be linked to either the Demo program or the full install version of the program, but not both.

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Lesson 1

The objectives of Lesson 1 are:

- Learn how to start LandView 5
- Become familiar with the LandView 5 database management program
- Become familiar with LandView's mapping component—MARPLOT

Starting LandView 5

Two installation³ options are available from the installation CD/DVD—installing the LandView 5 program and installing the LandView 5 Demo.⁴ Both LandView 5 and the LandView 5 Demo can be installed at the same time. Each will install in its own directory, and each will have a shortcut icon installed on the Desktop. The Tutorial assumes that the user will first start the LandView 5 Demo.

Double click on the **LV5_Demo** icon on your Desktop to start the program. LandView opens to display the screen shown in Figure 1. We will refer to this screen as **Home**.

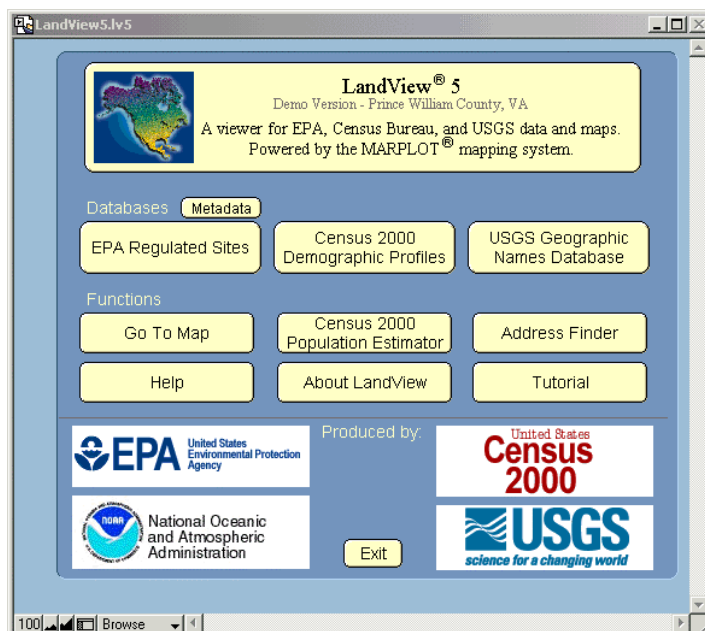


Figure 1—The LandView Opening Screen—The Home Screen

Getting Comfortable with LandView 5

³ A third option is installing the LandView Demo program as an Internet download. The LandView Demo program together with this Tutorial is available for download from the CAMEO Home Page at www.epa.gov/ceppo/cameo.

⁴ Users lacking Adobe® Acrobat® Reader® or who have a version of Acrobat Reader installed that is prior to Version 4 are advised to get an updated version from Adobe <http://www.adobe.com>. Graphics in this Tutorial may not be visible in earlier versions.

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At this time, only the LandView database management program is running; MARPLOT, its mapping software, is not. The MARPLOT application does not start until **Go to Map** is invoked from either the Home screen or from one of the individual database components.

Buttons identify access to the three databases in LandView 5—the Census Bureau’s 2000 Demographic Profiles, the USEPA’s database of regulated facilities and the Geographic Names database maintained by the U. S. Geological Survey. A separate button provides Metadata—data about data—for the included databases.

An estimate of population around a point, as we will see in Lesson 5, can be initiated either from within LandView or MARPLOT. In either case, the **Census 2000 Population Estimator** references the current position of the ‘Focus Point’ in MARPLOT.

The mapped location of an address can be determined knowing both the street address and its ZIP code. (If the street, displayed in MARPLOT, lacks address information, you can select on an intersecting street to get a mapped location.) The **Address Finder** updates previous MARPLOT functionality that required also knowing the identity of the County containing the address. This subject is covered as part of Lesson 3.

The **Help** button in LandView 5 provides linkage either to the PDF file installed on the hard drive as part of the installation of the LandView⁵ application or to its most current version maintained on the Web at:

http://landview.census.gov/geo/landview/lv5help/lv5_tabcont.html

The Help file, in PDF format, is not separately included with the LandView 5 Version. If the program has been independently downloaded, the Help files are available only at the above URL. The buttons displayed in Figure 2 provide access paths.

Throughout LandView, and in MARPLOT, other **Help** buttons provide specific help information within the context of their location.

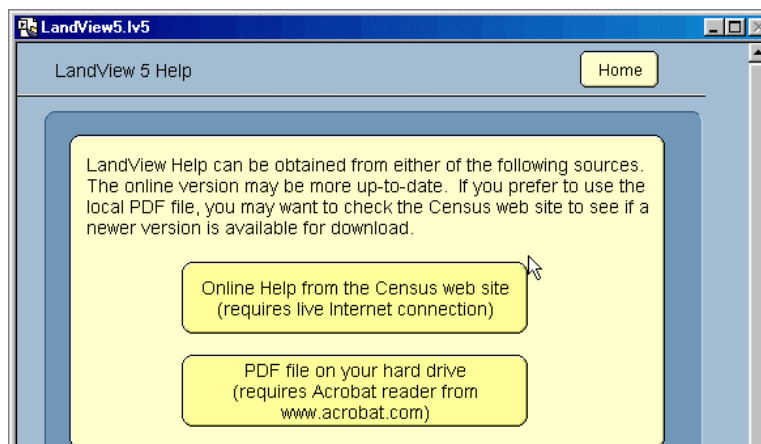


Figure 2—Help Is Available to LandView Users

⁵ LandView Help is also included as part of the installation of the LandView Demo program.

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The Table of Contents for the LandView Help is displayed in Figure 3. The user is particularly referred to the section entitled, [The FileMaker Interface](#).

What's New in LV 5?	Problems or Errors in LandView 5
About LandView	Running LandView 5 on a Network
Getting Started	Importing Shapefiles
MARPLOT®	Positional Accuracy of TIGER/Line® Data
The LandView Databases	
►Census ►EPA ►USGS ►Metadata	
LandView Program Features	
Address Finder	Show on Map
Internet Access	Summarize
MARPLOT Sharing Menu	View as List
Population Estimator	The FileMaker Interface
Setup Find	Thematic Mapping
Show All Records	
Back to LandView 5	
Comments or questions may be sent to: landview@geo.census.gov	

Figure 3--LandView Help's Table of Contents

Returning to Figure 1, the four logos at the bottom of the screen identify the federal agencies providing data and/or technical support to the LandView program. The logos act as buttons to access each agency's home page on the Internet. Other buttons within LandView provide Internet access to specific programs within the agencies.

Getting Comfortable with MARPLOT

The **Go to Map** button starts MARPLOT or allows returning to MARPLOT from LandView once MARPLOT has been started. In MARPLOT, the **Sharing** menu allows return to LandView.⁶ Invoking **Go to Map** displays the MARPLOT opening screen seen in Figure 4.

⁶ An alternate navigation technique is to move between the two applications using the icons on the Windows **Start** menubar. If the **Start** menubar is not visible, the keystrokes [Control]-[Escape] will bring it into view.

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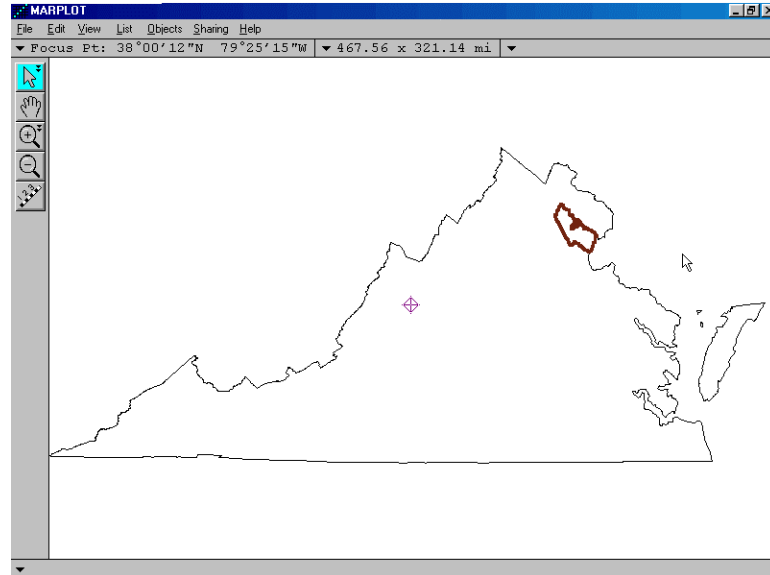



Figure 4—The MARPLOT Opening Screen

A small, flashing, cross-shaped icon called the **Focus Point**, is at screen center. The Focus Point marks the location of the most recent point of interest on the map. Each time you click on the map with the Arrow Tool, , the Focus Point moves to the location of your click. The Focus Point also changes in response to other operations.

The latitude/longitude coordinates of the Focus Point are shown in the upper left corner of the map window. The dimensions of the map window are shown in the upper middle part of the map window.


The opening screen displays two map layers—a States layer and a Counties layer. The LandView contains data on only one State—Virginia and one County—Prince William County⁷.



Note four inverted triangles in the Header Bar and at the base of the map screen. These display drop down menus that replicate menubar commands. As you become a more comfortable MARPLOT user, you may prefer these to other navigational pathways.


⁷ A sharp eye will detect that the two ‘independent’ cities within Prince William County—Manassas and Manassas Park In four states (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places that are independent of any county organization and thus constitute primary divisions of their states; these incorporated places are known as “independent cities” and are treated as equivalent to counties for data presentation purposes.



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The MARPLOT Navigation Tools


We have already discussed the Arrow Tool, , but it has an additional function. It is used to ‘select’. Selection is the process where one or more⁸ MARPLOT map objects are selected from available objects so that MARPLOT can employ a procedure. When selected, the object is highlighted by a series of red, square points. When a single object is in select mode, the identity of the object—its name, its containing layer and its containing map—displays at the bottom of the screen.

Notice the two triangles⁹ on the  icon. These indicate an additional function—multiple selection within a defined area. Clicking and dragging with  will place multiple map objects in select mode. A dialogue box will ask you to identify the layer or layers that you wish to include in your selection.

The Hand Tool, , is used for making minor adjustments of your map display.

The Zoom In Tool, , and the Zoom Out, , Tool will be discussed together. Clicking on the map screen with either of these tools changes the scale of the map by a factor of two, and the click point becomes the center of the new display.


The Zoom In Tool, , also has a secondary function. Clicking and dragging with the tool opens a new map window zooming-in to the dragged area. It is the preferred method for zooming in to a new map area.

The Tape Measure Tool, , as its name implies, measures distances. When used, the distance between two map points and the bearing in compass degrees between the first and second point display at the bottom of the screen.

Practice switching back and forth from LandView 5 to MARPLOT . When you feel comfortable, switch back to MARPLOT so that you will be ready for the next step.

Some notes on the File Menu

Save as a Picture . . . The MARPLOT map screen can be saved as an image file. There are two options: 1) Saving as a bitmap image saves the map screen pixel by pixel as displayed and 2) Saving as a Windows metafile saves each displayed map object as a **vector** image. MARPLOT map objects are vector images—a format that allows enlargement or reduction of the image without distortion.

⁸ Multiple ‘selection’ or ‘deselection’ can be accomplished by holding down the [Shift] key while using the  tool.

⁹ The triangles are actually buttons that allow the user to specify the selection area as either a circle or a rectangle.

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Print . . . allows sizing of the printed map. To best replicate the display screen, **Print Setup . . .** should first be set to 'Landscape'.

Import . . . and **Export . . .** are powerful MARPLOT functions. The user is referred to the MARPLOT documentation for further information.

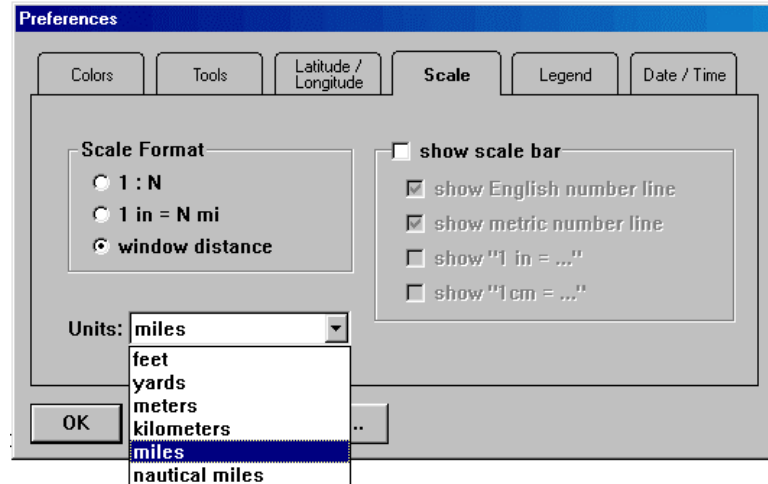


Figure 5—The Preference Dialogue

Preferences . . . provides a number of options for customizing the MARPLOT display. The option displayed in Figure 5 is the option to change map scale.

The MARPLOT default for Scale is **Window Distance**—the distance in selected map units from west to east in the map display window. A scale shown as **1:N** interprets as one inch on the map relates to an equivalent ground distance of N inches, e.g., 1:24,000. A scale of **1 in = N mi** is notation typical of a road atlas, e.g., 1" = 5 miles. The Scale Format currently checked in Preferences is the default scale format—window distance.

Most of the other options in **Preferences . . .** relate to enhancement of printed maps for display purposes.

List/Layer List . . .

The menu command **List/Layer List . . .** opens the dialogue box displayed in Figure 6. This is an important MARPLOT work area, and we will provide detailed notes.

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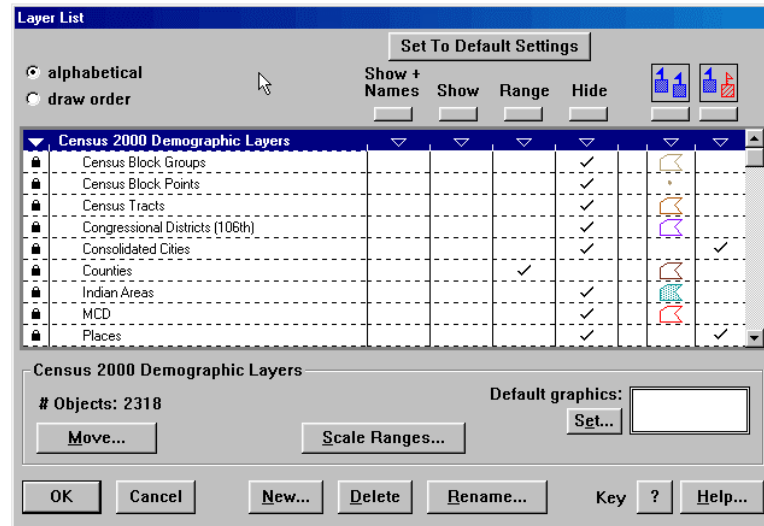


Figure 6—The Layer List Dialogue

Note that there are two layer display options—**alphabetical**, the default setting, and **draw order**. Draw order needs only to be invoked if you suspect that there are map objects hidden from view. If you were to have a Boats layer and a Lakes layer, and Boats drew before Lakes, the boats would be at the bottom of the lake and would not display. In **draw order**, the **Move . . .** button would allow you to make the necessary corrections.

Figure 6 opens to display the **default layer settings**. As you make changes in MARPLOT, some displayed layers will be hidden and others will be placed in display mode. **Set to Default Settings** returns the user to the original display options.

The Layer List, itself, can be seen to be of two types—**Group** headers and individual **Layers**. The Group header is identified by a triangle icon, which changes direction to indicate either an open or closed group. Clicking on the triangle acts to display or hide the layers contained within a group. Layers are identified by the padlock symbol. Unlocking a padlock places that layer into an active mode where objects on the layer can be added to, deleted or modified. *Note: Layers stored on read-only media (CD-ROM or DVD-ROM) can not be unlocked.*

Figure 7 provides a new view of the Layer List Dialogue with all Groups but the Census TIGER/Line 2000 group closed. Note the reference to Federal Lands. The GNIS from the USGS is included on all released versions of LandView 5, including this Tutorial. LandView and MARPLOT data for Federal Lands are included only on the national two-DVD release of LandView 5. They are included here as empty layers to show the content available on the national DVDs.

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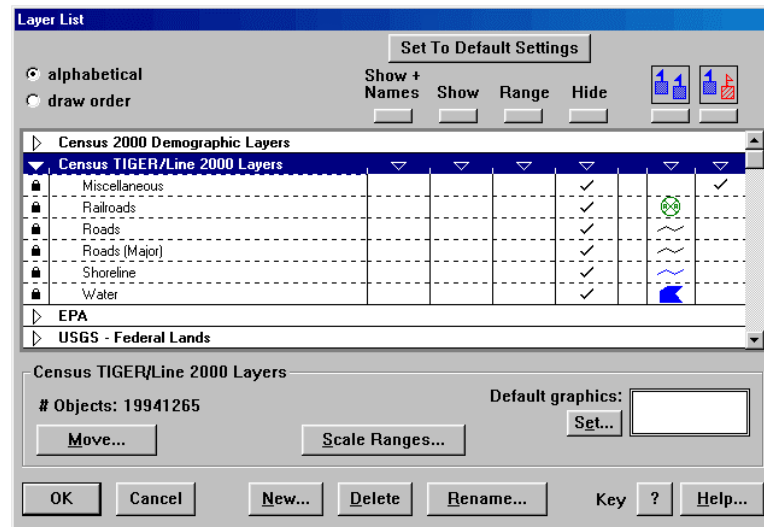




Figure 7—Only the TIGER/Line Layers Display

Notice in both Figure 6 and Figure 7 that when a Group header is in select mode, a screen message identifies the group and the number of map objects on all layers within the group. Similarly, if a layer were in select mode, the message area would identify the selected layer and both the number of map objects on the layer and the number of maps contributing map objects to the layer.

The six buttons, , heading six columns of display options are global buttons—invoking one of the buttons acts on all layers below it to place them in the specified display mode. Notice that each Group header has inverted triangles, , similarly positioned over the columns. These triangles act as buttons to bring all layers of a group into the selected display option.

Three of the headings—**Show with Names**, **Show** and **Hide** are rather self-explanatory. The others need some discussion.

Range is a user option that allows selected layers to **Show** or **Hide** automatically. If you were viewing an entire state, you would not want the Roads layer to show, as the roads would be indistinguishable from each other. Similarly, if you were looking for a street address, you might not want the Places layer to show, as it would obscure details of the neighborhood. Users can adjust **Range** with the **Scale Ranges . . .** button. The **Scale Ranges . . .** dialogue is shown in Figure 8.

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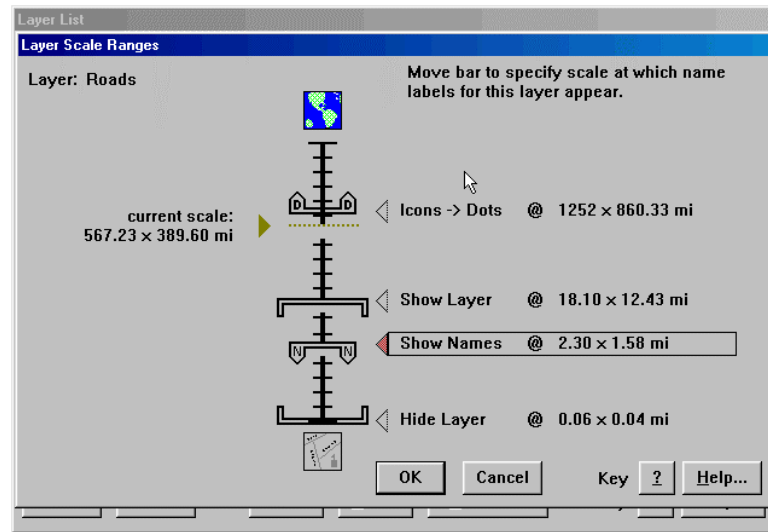


Figure 8—The Scale Ranges Dialogue

Figure 8 displays the current setting for Roads. When Range is selected as the display option, Roads will display from a window width of 0.06 miles (MARPLOT's maximum zoom-in) to 18 mile. Identifying names will display for the selected layer at all window width settings below 2.3 miles. If the user wanted road names to display only at window setting below one mile, the **Show Names** bar could be dragged to that setting.

Blue-Blue and **Blue-Red** provide additional display options. **Blue-Red** can be thought of as the Designer mode—if the designer of the original map data wanted to make one object on a layer blue and another red to emphasis a point, he could do so. **Blue-Blue** is known as the **Graphic Override**. Using Graphic Override, all objects on a layer can be set to display options chosen by the user. The **Set . . . (Default Graphics)** button provides the pathways.

Other options available from the Layer List include the ability to create new layers or groups, delete existing layers or groups or rename layers or groups. An **OK** is necessary to confirm changes and return to the map display. **Cancel** will cancel all changes made while in the dialogue box. Layers can be moved into and out of Groups with the **Move** button.

List/Map List . . .

Before we try some exercises, let us look at **List/Map List . . .** This is another important MARPLOT work area, and it is shown in Figure 9.

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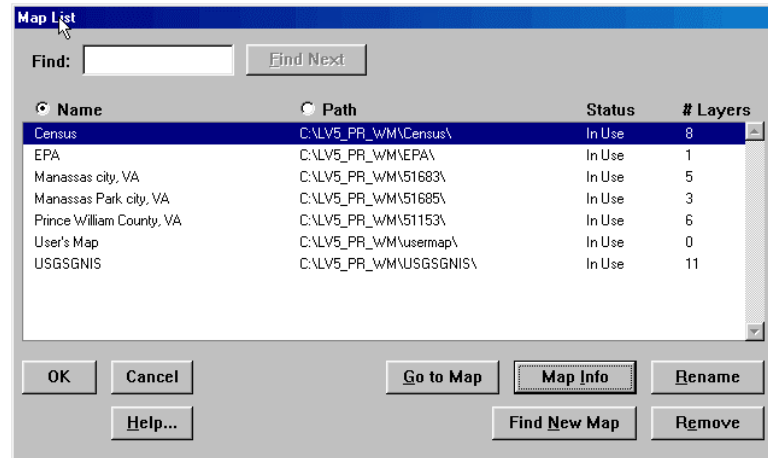


Figure 9—The Map List Dialogue

Whether or not you presently have the installation CD/DVD in your computer drive determines the number of maps that are presently accessible in MARPLOT. If you have removed the installation CD/DVD from its drive, your Map List should appear as above. If the CD/DVD is still in its drive, the Map List will include all maps included on the CD/DVD, and the list is long. MARPLOT is programmed to find all maps on an alternate drive containing a LandView application.

When the map list is long, the **Find:** dialogue is very helpful. Enter the first few characters of a County name, and the list will scroll to that name.

With the Census map highlighted, we will use the **Map Info** button to display detailed information about the Census map. This is shown in Figure 10.

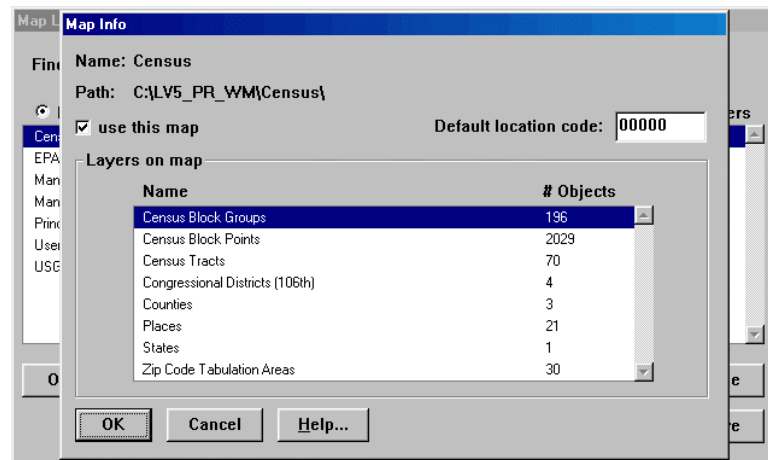


Figure 10—The Map Info Dialogue within the Map List Dialogue

Map Info identifies the layers included on the selected map and the number of map objects on each layer. Notice, that for the abbreviated Census map included with the Tutorial, there is one State—Virginia and three Counties—Prince William County and the two independent Cities of Manassas and Manassas Park (considered as Counties, as they are primary divisions within the State).

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The **User's Map** is a special place. Map objects created by the user and not specifically assigned to another map are placed on the User's Map by default.

The **Go To Map** button returns the user to a screen displaying the complete area for the selected map. The **OK** button returns the user to the same screen that was displayed on entering the dialogue.

Some Definitions

Other than special objects used for display or reference, **Map Objects** are of three types—**Points**, **(Poly)lines** and **Polygons**.

Points are map objects represented by a single value of latitude and longitude, a point, that may represent physical objects of greater magnitude, e.g., a city represented by its centroid.

(Poly)lines are map objects best represented by a line, e. g., a road or a river. The term **Polylines** references the fact that the line is really a series of points (**Vertex or Vertices**) connected by line segments.

Polygons represent an area, such as the boundaries of a city. Again, the polygon is a series of points connected by line segments.

A **Layer** is a collection of similar map objects that can be viewed alone or in relation to map objects contained on other layers—a layer of EPA regulated facilities can be viewed in relation to the road network.

A **Map** is the smallest rectangle, defined by latitude and longitude, that will contain all of the map objects assigned to the map. The map of Virginia touches the east and west boundaries of the display screen while a map of Illinois would touch the north and south boundaries of the display screen.¹⁰

A **Map** can contain many **Layers**—as the Census map, viewed in Figure 10, shows.

The same **Layer** can be contained on many **Maps**. All County maps contain an identical Roads layer, and roads are continuous between Counties.



Some Exercises.


First, use **File/Preferences . . . /Legend** to display the **Legend** on screen. This will help to identify new layers as they appear. As you become a more familiar MARPLOT user, you may reserve this step for only your printed maps.



From the entry screen—the State of Virginia, zoom-in on Prince William County using each of the following three methods:

¹⁰ **Map** and **Layer** can also be defined as elements of the MARPLOT application program. To MARPLOT, a **map** is any directory accessible to the MARPLOT application that contains a *name.map* file. Objects on a **layer** are defined by one or more sets of similarly named files contained in one or more MARPLOT map directories. Generically, the file set would include *filename.lyr*, *filename.obj* and *filename.sum*.

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For the first method, use the  tool to click on Prince William County until the image almost fills the screen. Notice the increased map detail within the County as scale increases. Use  to approximate the original screen.

Next, again use the  tool, this time to drag a rectangle around Prince William County.

Finally, we will use **List/Map List . . .** as a navigation tool. Highlight the Census map in the Map List and use the  button to return to the map display window. Similarly, we can use **List/Map List . . .** and  to select Prince William County. This is the selection shown in Figure 11.

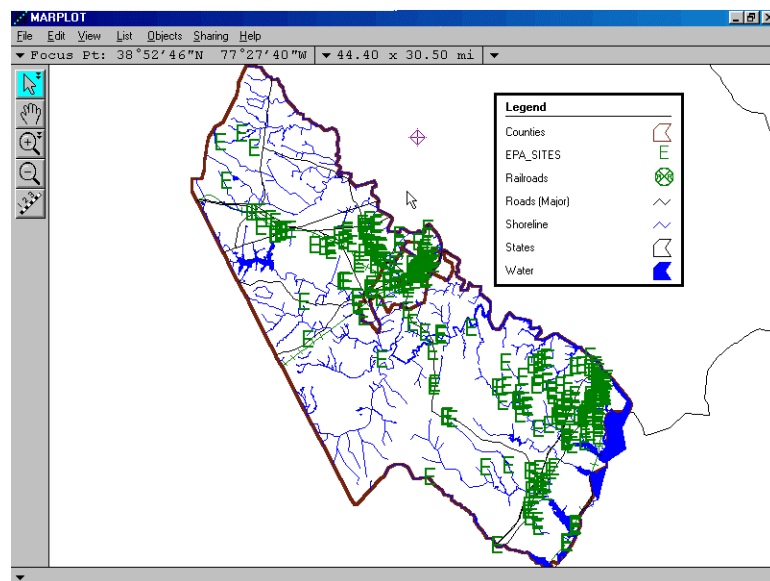



Figure 11—Prince William County Displaying the Default Scale Range Values

In Figure 11, we still see the boundary for the State of Virginia. We also see the boundary for Prince William County defined in the Graphic Override mode as a heavy brown line. We see only the **Major Roads** in the County. A number of 'E' icons are identified as EPA Sites. At the moment, these provide map clutter, so go to **List/Layer List . . .** to hide the EPA_sites layer.

Manassas and Manassas Park are separately identified areas within Prince William

County. Use the  tool, again, to further zoom-in on these Cities. Now, place Manassas Park in select mode by clicking on its boundary. You will know when it is properly selected, as its name will appear at the bottom of your screen. This is the view shown in Figure 12.

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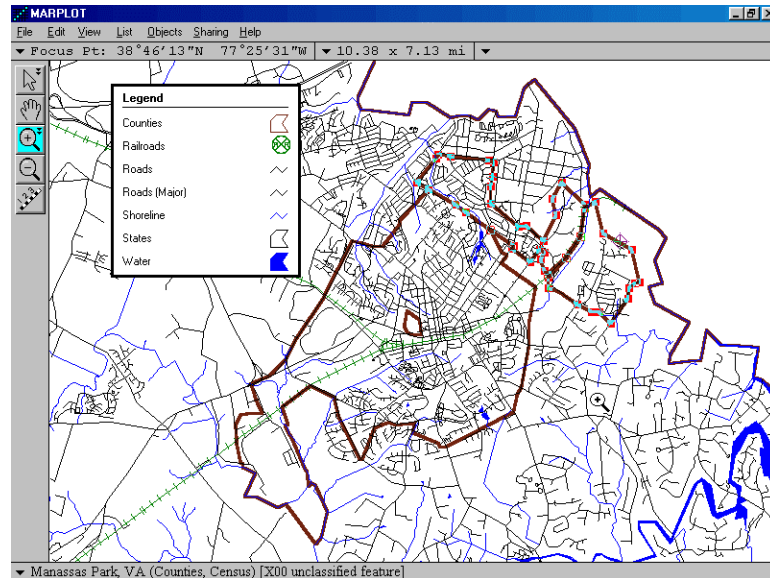


Figure 12—Zoomed in on Manassas and Manassas Park (selected)

We now see a greater depth of detail including both Major Roads and the local road net. Notice that the selected map object—Manassas Park—is identified at the bottom of the screen.

Note: If the system seems to be taking too long to draw the map, you can press the [Escape] key, which causes MARPLOT to stop drawing. It displays the message [DRAW INCOMPLETE] at the bottom of the map window to remind you that drawing was stopped while the map was incomplete. You can still click on the map and use the tools to continue to zoom in or out. The map will be completely redrawn if you change scale. (You can also use **Redraw** under the **View** menu to force the same view to be redrawn completely.)

You may now continue with Lesson 2 or close LandView and resume the Tutorial later. As mentioned earlier, the LandView 5 product consists of two separate computer programs, so you need to separately close the MARPLOT map viewer and the LandView 5 data viewer. Each program can be closed either from the **File** menu or using the close symbol, **X**, in the upper right hand corner of the screen.

If you wish to continue with Lesson 2, you are currently in MARPLOT, so click on **Sharing/LandView/Go to LandView** to return to the LandView screen.

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Lesson 2

The objective for Lesson 2 is:

- Become familiar with the contents of the LandView 5 database management program
- Explore LandView's database search procedure—Setup a **Find** leading to a sub-set of the data—a **Found Set**

You can access a wide range of information using LandView 5, including Census 2000 population and demographic data, EPA information on air facilities, hazardous waste facilities, and Superfund sites, and information on geographic landmarks from the USGS Geographic Names Information System (GNIS).

To start this exercise, you will need to be in LandView 5. If you closed LandView at the end of Lesson 1, restart LandView as described at the beginning of Lesson 1.

Census 2000 Data

Click on the **Census 2000 Demographic Profiles** button. It opens up the screen shown in Figure 13.

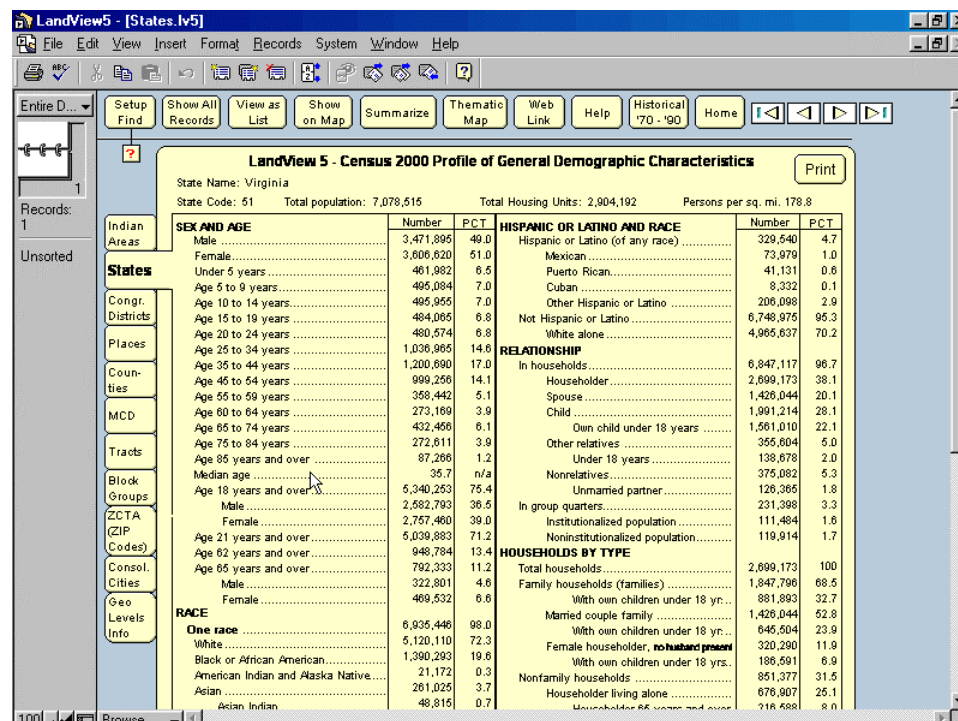


Figure 13—Census Demographic Profile for the State of Virginia

At first glance, the depth of data is obvious, and a vertical scrollbar is required to fully explore the data offering. This screen presents Census 2000 data for various legal or political and statistical areas. The tabs along the left side of the form correspond to the

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levels of geography for which data are presented. Clicking on a tab brings up the first alphabetical record in the Census 2000 data set for that level of geography. The political/statistical areas that nest hierarchically within one another are: state, counties, minor civil divisions¹¹ (MCDs), census tracts, census block groups and census blocks. (Because of privacy issues, only a more limited set of data is available for census blocks. The primary source for accessing block data is the **Population Estimator**.) Places and 106th congressional districts nest only within a state; they can cross county boundaries. Indian Lands¹² and ZIP Code Tabulation Areas (ZCTAs) can and do cross state boundaries. Please note that whenever an Indian Land or ZCTA entity crosses a state boundary the Census 2000 Demographic profile will present separate data records for each state portion.

For this Tutorial, the LandView databases are limited to Prince William County, Virginia (and its two included independent cities of Manassas and Manassas Park). For further information about these geographic concepts, see the Census Geographic Glossary in the LandView **Help** Section under Census databases.

The nine buttons across the top edge of the data screen perform customized FileMaker scripts to accomplish specific tasks.

The ‘Setup a **Find**’ button allows a user to define criteria for searching the database and so limit browsing and other actions to a subset of records based on the ‘Setup a **Find**’ parameters. Once criteria are established, the **Find** button in the **Status Area** initiates the search. The search results are known as the **Found Set**

The **Show All Records** clears the **Found Set** and allows the user to see all records in the data set.

The **View as List** presents each record on a separate line so a user can view multiple records for a geographic area at a time. However, unlike the **Form** view, not all fields are visible on one screen.

LandView 5 allows a user to connect to selected LandView 5 support sites on the Internet. To use the **Web Link** function, a user must have both a connection to the Internet as well as an installed Internet browser. Clicking on the **Web Link** button opens up a dialogue box that lets the user choose among selected Census Bureau sites. The first selection, Figure 14, connects to the Census 2000 page—a site dedicated to the explication of information relating to the 2000 Decennial Census, and the second selection, Figure 15, connects to a potpourri of Population and Household Economic Topics. The user can use these functions to either get more up-to-date population figures or get additional Census 2000 information not found in LandView 5. A third choice brings the user to the home screen for the U. S. Census Bureau.

¹¹ Although Virginia does contain minor civil divisions (magisterial districts), LandView does not present them because they are not well known to the average citizen. Clicking on this tab displays a message box listing those states that do.

¹² Virginia contains no Indian Lands—clicking on this tab displays a message box listing those states that do.

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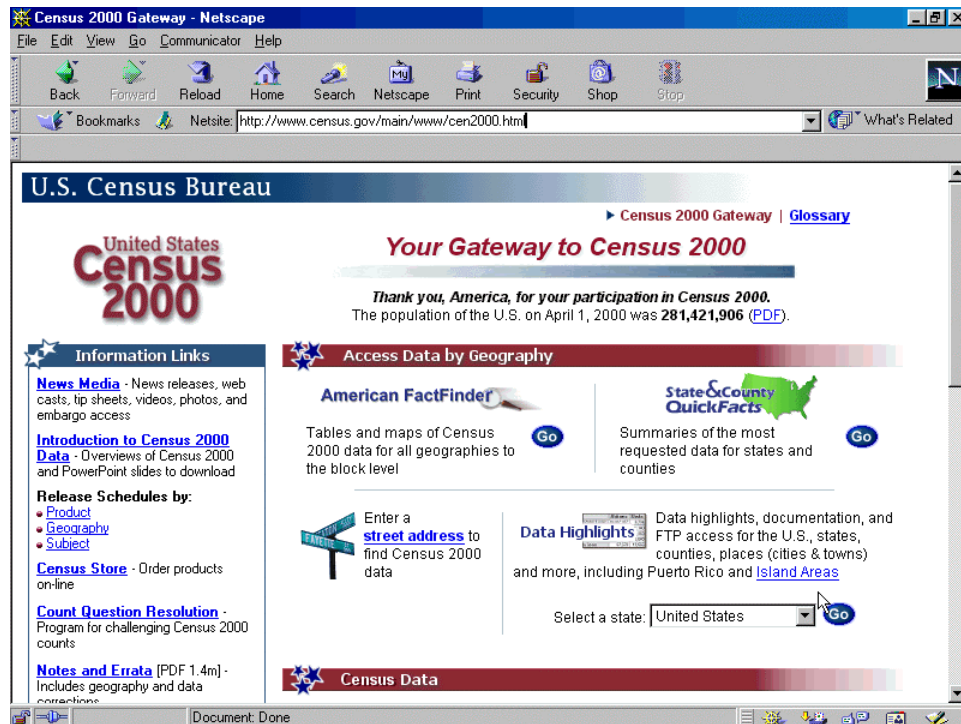


Figure 14—The Census 2000 screen accessed using Web Link

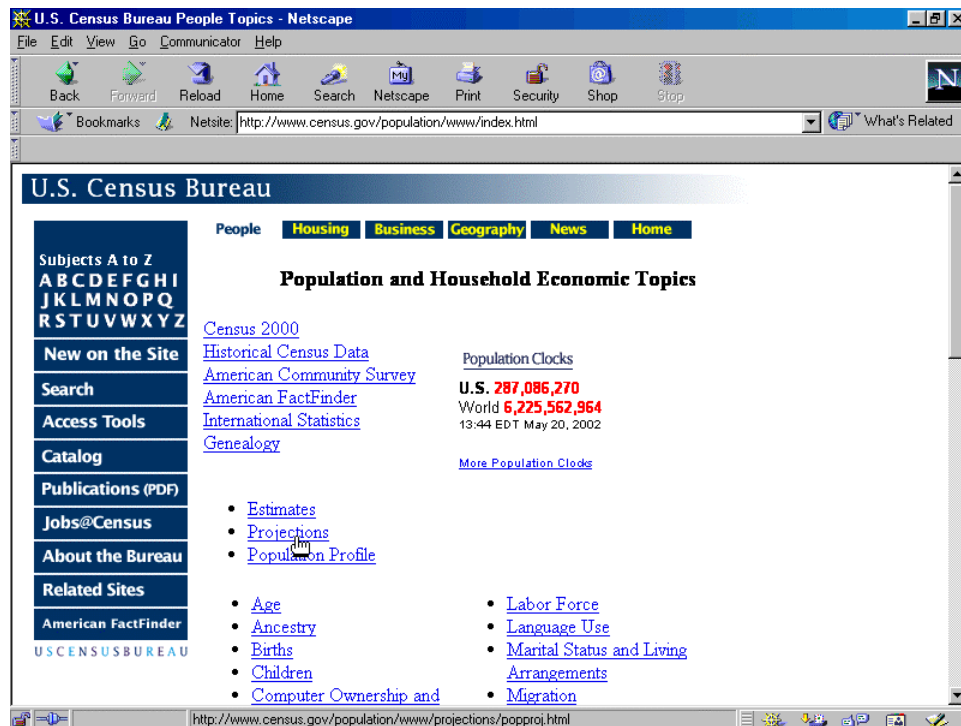


Figure 15—Other Internet Census Searches from LandView

Refer back to Figure 13 for the following features:

The **Show on Map** button will open a MARPLOT map that shows the geographic area selected on the database form.

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The **Summarize** button totals the numerical fields for records in the Found Set.

The **Thematic Map** button creates a thematic map based on a selected Census 2000 data field.

Historical 70–90 provides an historical reference for key data points (Historical data is available in LandView for states and counties only).

For further details about each of these functions see LandView Help. Some of these functions will be covered in more detail later in the Tutorial.

Click on the **Home** button to return to the LandView Startup window.

Using the Census 2000 Data

There are many methods for extracting useful information from the Census Database. Significant ones are explored in Lessons 3 to 6. Here, let us give one example of how **Sort Order** in the database can aid in extracting information. We wish to identify that cluster of population (we will use Census Block Groups as our search unit) in Prince William County that contains the largest percentage of people that are 65 years of age and older.

With the Census Block Group tab in show mode, use **Records/Sort . . .** and the **Clear All** button to remove any data that might be in the **Sort Order** column. In the left hand column, scroll to “Age_65_years_and_over”. (The first entry of the term—the second and third entries, as can be seen from the database, refer to males and females.) Highlight it and use the **Move** button to move it to the right hand column. As we want the oldest, we need to **Sort** in **Descending** order. Highlight the data field in the right hand column. Select **Descending** as the Sort order, and use the **Sort** button. We return to the database with the records sorted by the Age 65 and over field. In our first record, 27.7% of the population at the top of the Census Block Group Sort List are aged 65 or older!

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U. S. Environmental Protection Agency Data

Click on the **EPA Regulated Sites** button. The screen shown in Figure 16a appears.

The screenshot displays the LandView 5 application window titled "LandView5 - [epasites.lv5]". The interface includes a menu bar (File, Edit, View, Insert, Format, Records, System, Window, Help) and a toolbar with buttons for Setup Find, Show All Records, View as List, Show on Map, Web Link, Help, Home, and navigation arrows. A left sidebar shows "Records: 368" and "Unsorted". The main content area is titled "Environmental Protection Agency Database Information Extracted From 'ENVIROFACTS' (www.epa.gov/enviro - extracted August, 2001)" and includes a "Print" button. The data is organized into several sections:

- FACILITY IDENTIFICATION**: Contains fields for Name (7 ELEVEN 32286), Address (8375 SUDLEY RD, MANASSAS, VA 22110), SIC, EPA ID (000006892394), State-County Code (51153), Latitude (+38.774558), and Longitude (-77.501950).
- EPA SYSTEMS**: Includes checkboxes and fields for RCRAInfo (Hazardous Waste) [checked], PCS (Wastewater Discharges), TRI (Toxic Release Inventory), AIRS/AFS (Air Releases), and CERCLIS (Superfund Sites).
- CHEMICALS (AIRS, PCS, TRI only)**: A table with columns for Code, Chemical or Parameter Name, and Database.

Code	Chemical or Parameter Name	Database

Figure 16a—An EPA Regulated Facility in the LandView EPA Database

The EPA database contains information on EPA regulated sites throughout the country. Some of the information included are: the address of the site, the latitude and longitude and the EPA ID number. The database also identifies the EPA media program or programs under which the facility is regulated as well as chemicals subject to regulation. For further information about these databases, see EPA Databases in the LandView 5 **Help** Section.

By clicking on the **Web Link** button shown in Figure 16a, the user is taken to the USEPA's **Envirofacts Warehouse** where additional information and more current information on the displayed facility can be obtained. The opening screen is displayed in Figure 16b.

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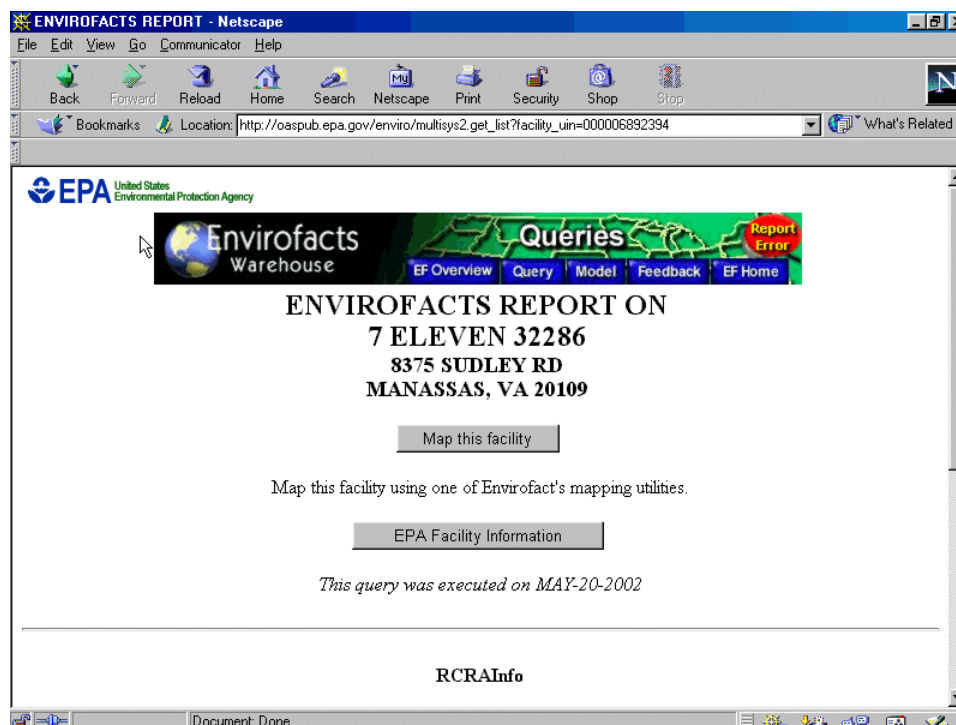


Figure 16b—USEPA Envirofacts Warehouse Record for the Facility in Figure 16

Besides the Internet access button there are six other buttons that appear across the top of the screen that perform FileMaker scripts to accomplish specific tasks.

The ‘Setup a **Find**’ button allows you to limit browsing and other actions to a subset of database records based on the query conditions you specify.

The **Show All Records** allows you to see all records by cancelling the query conditions.

The **View as List** presents each record on a line so you can view multiple records for a geographic area at a time. However, unlike the form view, not all fields are visible.

The **Show on Map** button allows the user to map the site(s) in MARPLOT . More details about this feature and how it can be used in conjunction with the Query function can be found in the LandView **Help**.

Using the EPA Database

Let's suppose that you want to find the number of Hazardous Waste sites (RCRA) in Manassas, Virginia. We will use this as our first example of LandView searching—initiated with the ‘Setup a **Find**’ button and completed by invoking the **Find** command. This **Find** presents an anomaly, since, in Virginia, there is both a City of Manassas and a City of Manassas Park. We want to limit our **Find** only to the City of Manassas. This requires use of LandView’s menu of **Boolean** characters.

Use ‘Setup a **Find**’ to enter your search criteria. The screen that appears contains all field headings from the database but no data. Entering data criteria in appropriate fields creates the **Find** specification. Figure 17a illustrates the data entered to complete for the above search criteria.

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Figure 17a—‘Setup a **Find**’ for RCRA Facilities in Manassas City

Our criteria requires entry of a city and state identifier and identifying that part of the EPA database the we wish to search. This requires entering a check mark in the RCRAInfo (Hazardous Waste) checkbox. Notice, though, that our city identifier is preceded by a double equal sign (= =). The entry comes from the LandView menu of **Boolean** search displayed in Figure 17b. This menu is available from the LandView **Status Area** by mouse-clicking on the **Symbols** button. It is also available by right mouse-clicking in the data field of choice.

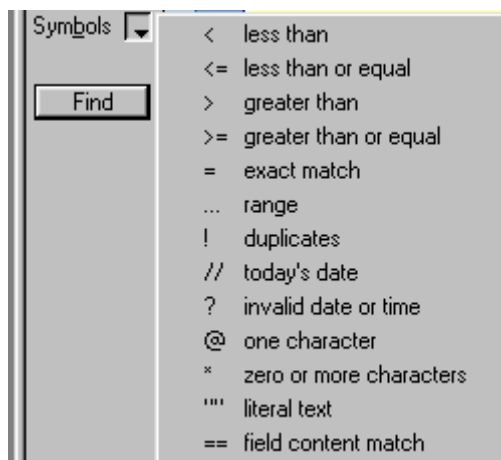


Figure 17b—LandView’s Menu of Boolean Search Characters

Notice, that for this for this **Find**, neither ‘= exact match’ or ‘"" literal text will work. These capture all data fields containing the word, “Manassas”. Only ‘= = field content match’ limits our search to fields that exactly match the entered text.

Use the **Find** button to initiate the search. The **Found Set**, shown in Figure 17c, displays the **Found Set** of 128 facilities in the Status area. These can be viewed as individual records using the flip chart icon in the Status area, or they can be viewed as a list by clicking on the dialogue button immediately above the flip chart. If you wish to map one

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or more sites, click the **Show on Map** button and a map will be displayed in MARPLOT. A dialogue box allows selection of map display options.

United States Geological Survey (USGS) Data

The **USGS Geographic Names Information System** database is accessed from the LandView **Home** screen. The screen shown in Figure 18 is displayed.

The screenshot shows the GNIS interface with the following data:

Feature Information		
Name	Antioch-McCrae School (historical)	
Type	school	
Fed Status		
Elevation		
Population		
ID Number	1462520	
Variant Name(s)		

Location Information		
State	VA	51
County	Prince William	1
Cell	Thoroughfare Gap	1
Latitude	38.81639	384859N
Longitude	-77.67611	0774034W
Source Latitude		
Source Longitude		

Historical and Descriptive Information	
DESCR	Display Detailed Historical and Descriptive Information

Figure 18—A School Record from the GNIS

The Geographic Names Information System (GNIS), developed by the USGS in cooperation with the U.S. Board on Geographic Names (BGN), contains information about almost 2 million physical and cultural geographic features in the United States. The federally recognized name of each feature described in the database is identified, and references are made to a feature's location by state, county, and geographic coordinates. The GNIS is our Nation's official repository of domestic geographic names information.

As can be seen in Figure 18, not all information fields contain data for all features. If the **Historical and Descriptive Information** button was accessed for Antioch-McCrae School, it would show the School to be an abandoned site. **Type** is a dropdown menu identifying features by descriptive categories, e.g., schools or harbors. For Prince William County and its included independent cities, the **Status** area shows the GNIS to contain 750 feature records.

Using the USGS GNIS Database

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We will look at one example of using the GNIS. We wish to determine the number of schools included in the database and to find out how many of these schools can be classed as elementary.

This requires two separate Finds. First, use the ‘Setup a **Find**’ button to enter our first criteria—schools, as a category. Other than displaying the category, no other information is required. On Clicking the **Find** button, we find an answer of 85.

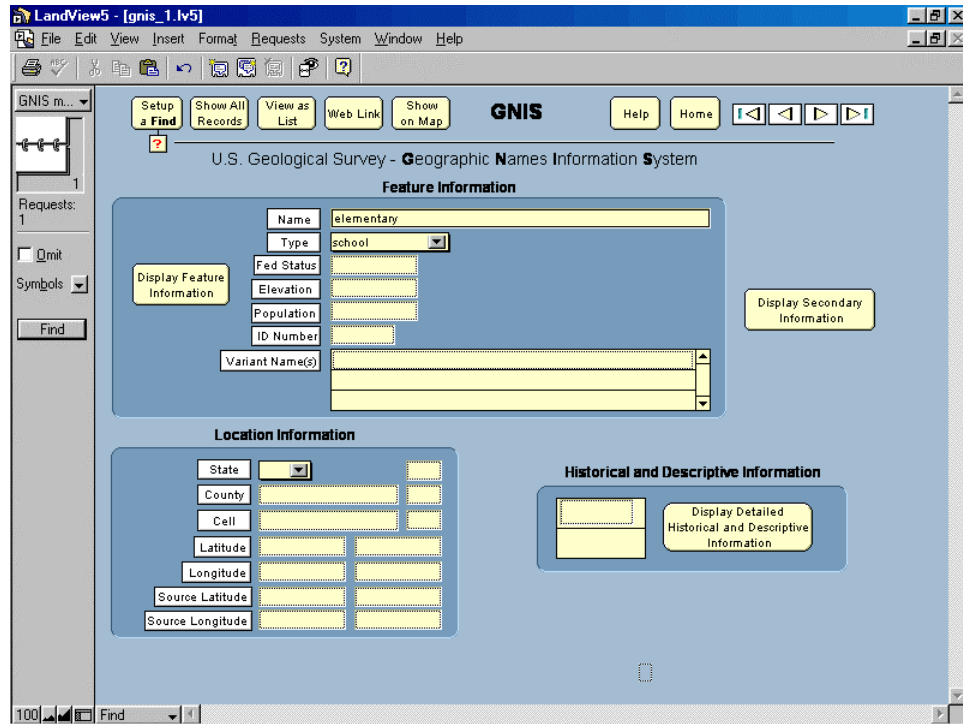


Figure 19—Searching GNIS for the Category—Schools Containing “elementary” in Name

We can repeat this search. This time our ‘Setup a **Find**’ criteria will include two terms¹³—the School category from our previous search and the term, “elementary”, included in our **Name** field. The ‘Setup a **Find**’ is illustrated in Figure 19. This Found Set includes 24 data records. It should be remembered that we have not found all elementary schools in Prince William County—only those whose name includes the term, “elementary”. Church schools that could be classed as ‘elementary’, such as St. Peter’s Parochial School, would not be found.

From here we proceed to Lesson 3. In Lesson 3, we take a new look at MARPLOT mapping and its interaction with LandView.

¹³ In Fact, we are searching the entire USGS database included in the Tutorial. In working with the CD/DVD LandView release, we would also need to enter appropriate geographic identifiers.

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Lesson 3

In Lesson 3, the objectives are:

- Use the **Address Finder** in LandView and the TIGER/Line map files in MARPLOT to locate a street address
- Determine the state, county, Census 2000 Tract number and block group codes for the location
- Use the MARPLOT **Search** function to locate a road intersection

In LandView, the new **Address Finder** function allows users to quickly map a specified street located within a county containing a ZIP Code® Tabulation Area (ZCTA). ZCTAs are a new statistical entity developed by the U.S. Census Bureau for tabulating summary statistics from Census 2000. ZCTAs are generalized area representations of U.S. Postal Service (USPS) ZIP Code three- or five-digit service areas. The term ZCTA was originated to differentiate between true USPS ZIP Codes and these approximations.

We have been referred to a medical specialist whose office is at 7950 Ashton Avenue in Bull Run VA 20109. We wish to locate the office on a MARPLOT map.

From the **LandView Home** page, click on the **Address Finder** button. The LandView 5 **Address Finder** window opens. Enter the first few letters of Street Name—Ashton and in the 5-digit ZIP Code—20109. Click on the **Find Street** button. The **Address Finder** dialogue box is shown as Figure 20.

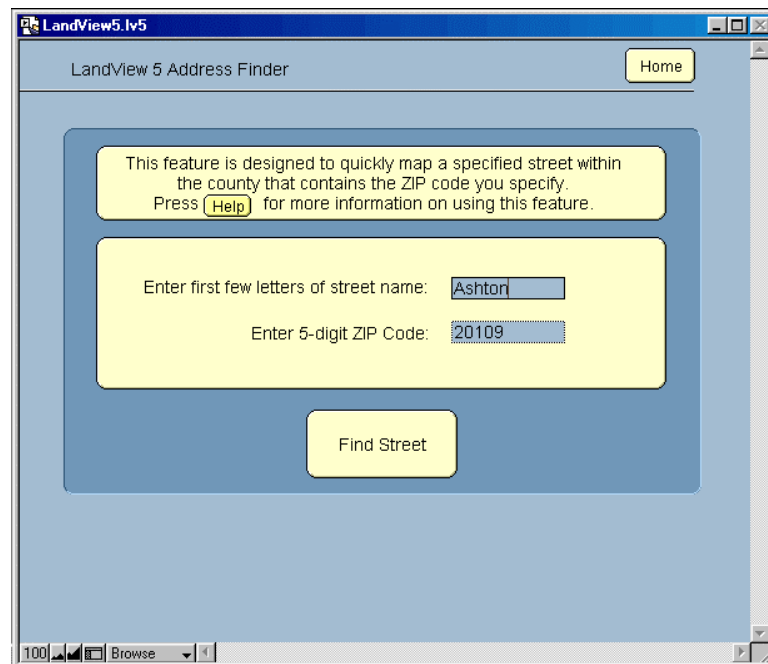


Figure 20—The Address Finder Dialogue Box in LandView

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The **Find Street** button returns the program to MARPLOT where a **Search** is initiated (More on MARPLOT's Search function later.). The resulting **Search Collection** is shown in Figure 21.

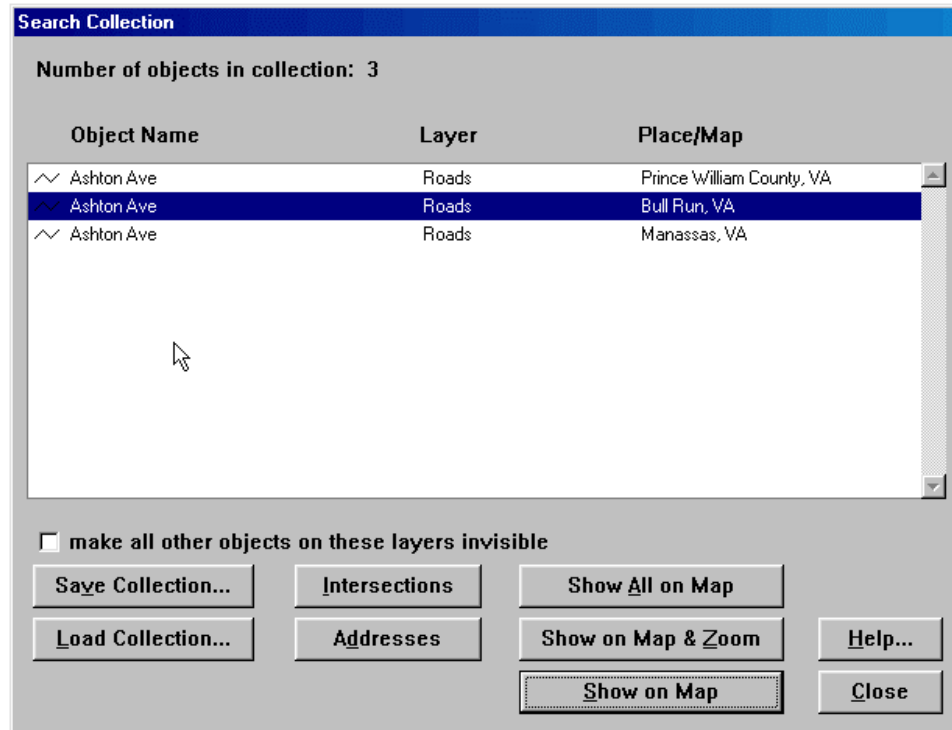


Figure 21—We have located Ashton Avenue in Bull Run VA

The **Search Collection** displays a list of all streets meeting our search criteria. Within ZIP Code 20109. Ashton Avenue passes through two communities and a section of unincorporated Prince William County. We need to highlight that section passing through Bull Run. To locate our street address of 7950, click on the **Addresses** button, and a new dialogue box opens. See Figure 22.

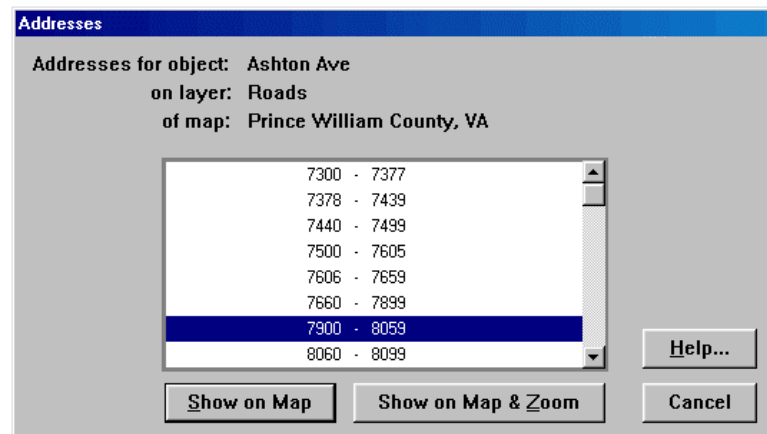


Figure 22—Address Ranges on Ashton Avenue in Bull Run VA

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MARPLOT identifies address **ranges** along each block face. A block face, generally, is the line segment contained between two intersections. However, if the roadway should be curving along the block face, two or three segments may define the block face. Normally, once you have identified the address range containing your address, you would use the button option, **Show on Map & Zoom**. This returns you to the map display screen with all of Ashton Avenue in **Select** mode and with the **Focus Point** on that segment of Ashton Avenue containing our address range. This is shown in Figure 23.

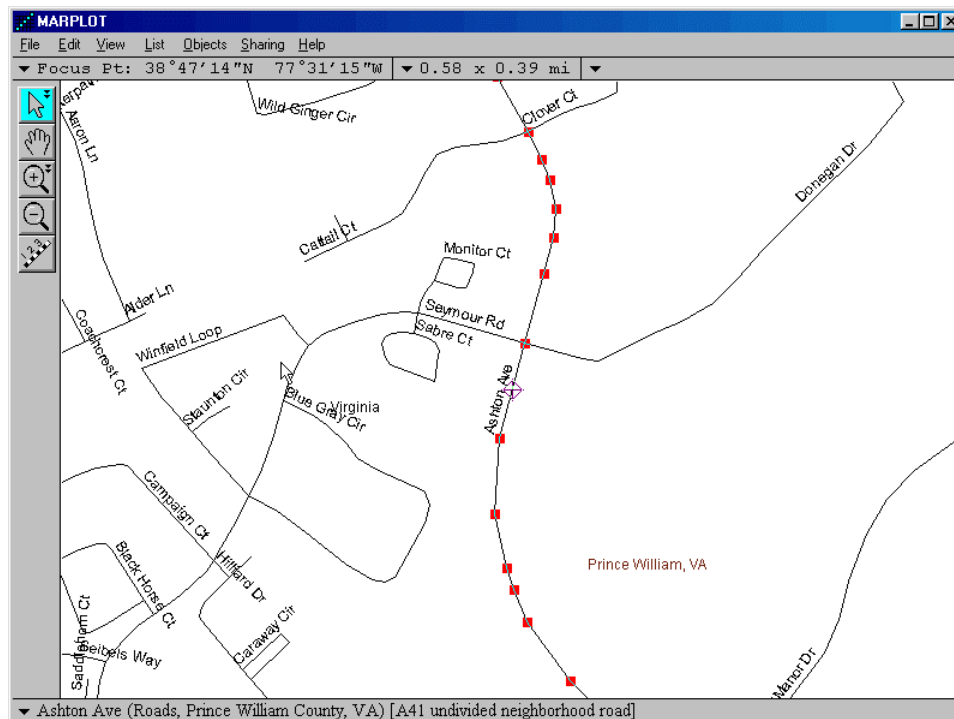
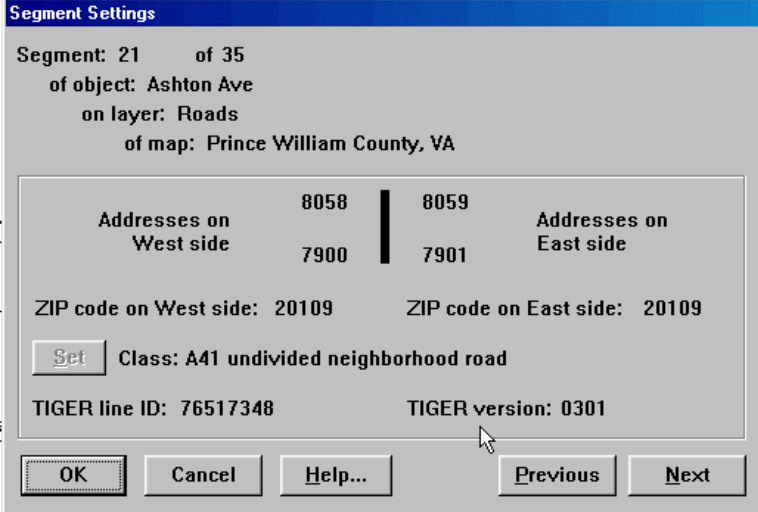


Figure 23—This segment contains 7950 Ashton Avenue, Bull Run VA 20109

We still have questions. Is 7950 on the east side of the street or the west side? Where is it, north and south, in relation to the segment? To answer these questions, we need to get more information. Use **Objects/Segment Setting . . .** to obtain this information. A new dialogue box opens. See Figure 24.

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The image shows a 'Segment Settings' dialog box from the LandView 5 software. The title bar is blue with the text 'Segment Settings'. Inside the dialog, the following information is displayed: 'Segment: 21 of 35', 'of object: Ashton Ave', 'on layer: Roads', and 'of map: Prince William County, VA'. Below this is a table with address ranges. The table has two main columns: 'Addresses on West side' and 'Addresses on East side'. The 'West side' column shows a range from 8058 to 7900. The 'East side' column shows a range from 8059 to 7901. Below the table, it says 'ZIP code on West side: 20109' and 'ZIP code on East side: 20109'. There is a 'Set' button to the left of the text 'Class: A41 undivided neighborhood road'. Below that, it shows 'TIGER line ID: 76517348' and 'TIGER version: 0301'. At the bottom of the dialog are five buttons: 'OK', 'Cancel', 'Help...', 'Previous', and 'Next'. A mouse cursor is pointing at the 'Previous' button.

Addresses on West side	8058	8059	Addresses on East side
	7900	7901	

ZIP code on West side: 20109 ZIP code on East side: 20109

Class: A41 undivided neighborhood road

TIGER line ID: 76517348 TIGER version: 0301

Figure 24—Address Matching using Objects/Segment Setting . . .

Remembering the advisory, above, about curving, block faces, we need to examine each segment adjacent to our selected segment. We can do this by either returning to the map and examining selected adjacent segments, or we can use the **Previous** and **Next** buttons to move to adjacent records. Doing so, we will find that four segments contain the same address range information—7900 to 8059. To properly locate the address we need to consider all four segments as a unit. Our target address will lie on the west side of the roadway (even numbers). Presuming that the house addresses are evenly spaced along the four segments, we will spot the address approximately one-third of the distance from south to north.

Before displaying this address on the map, let us call on another bit of MARPLOT functionality—the **Marked Point**. Use **View/Marked Point/Mark Focus Point** to identify our address location. The Marked Point will remain until removed or until a new Marked Point is chosen, even after MARPLOT is shutdown and restarted. Our located address is shown in Figure 25.

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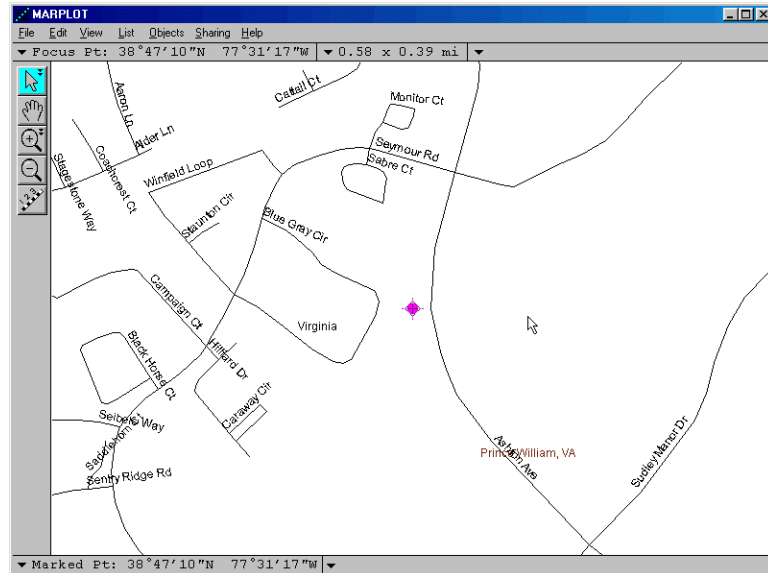


Figure 25—The Marked Point locates our address on Ashton Road

Determining the Census 2000 Tract and Block Group

There are reasons to know additional information about the physical location of a map point. For example, Census Tract and Block Group numbers can be required information in applying for a Federal assistance grant in various Federal programs. We could, in turn, go to our **List/Layer List . . .** and selectively **Show** individual layers until we had accumulated the data, but there is an easier way. Use **Sharing/LandView/Identify Census Areas at Current Map Pointer** to return to LandView. An information screen, shown in Figure 26, provides the data.

County: Prince William County, VA			
<u>State</u>	<u>County</u>	<u>Tract</u>	<u>Block Group</u>
51	153	9014.04	1

Figure 26—Locational information for our Marked Point

It is useful to point out that the numbers associated with our State and with our County are referred to as **FIPS Code**—for Federal Information Processing Standard. The FIPS Code identifier for Prince William County, VA is 51153. The FIPS Code for our two independent cities of Manassas and Manassas Park can be found in MARPLOT by referring to their names in **List/Map List . . .** They are, respectively, 51683 and 51685.

While the above address search was initiated in LandView, MARPLOT's **Search** functionality could have been used instead. Additionally, from MARPLOT, we can locate the intersection of two roads. One proviso—for an address or an intersection search in MARPLOT, it is important to know the County containing the address. For example, many of the three thousand and some counties in the country contain some variation of a Washington Street, and without identifying the Search county, we could be

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deluged with false positives. We will search for the intersection of Ashton Avenue and Donegan Drive in Bull Run, Virginia. But, first a principle:

In every MARPLOT search, we are looking for *one or more objects* on *one or more layers* of *one or more maps*.

To start the Search, use **List/Search . . .** to open the Search dialogue. Figure 27 shows the dialogue with our information entered.

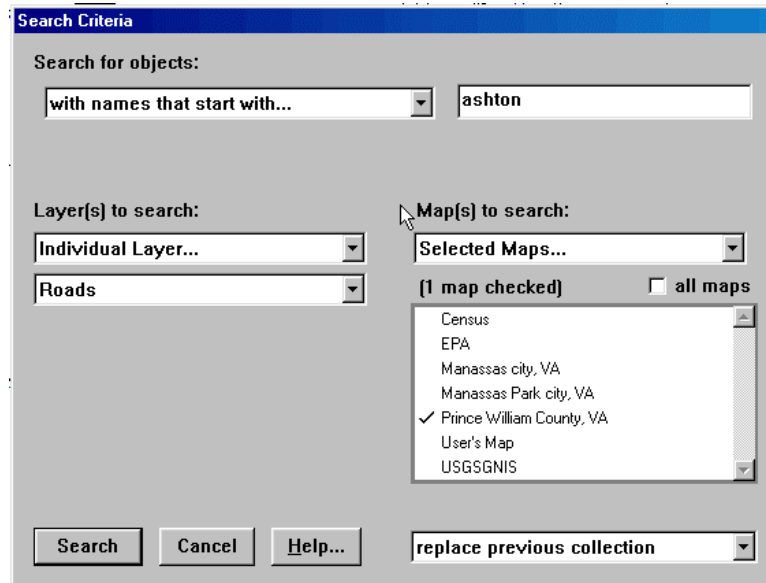


Figure 27—MARPLOT Search for a Road

The Search dialogue reflects our principle—object, layer and map. In searching for an object there is a dropdown menu that allows multiple methods for describing the object. We can specify individual or multiple layers, or all layers. If we are confident that our layer name is contained on only one map, we can default to “Maps in View”. However, for a street name we need to be careful to specify the containing County—therefore, Prince William County. The **Search** button initiates the Search.

The results of the Search are displayed in the Search Collection—the same information screen in which we viewed the results of our LandView Search. This is displayed in Figure 28.

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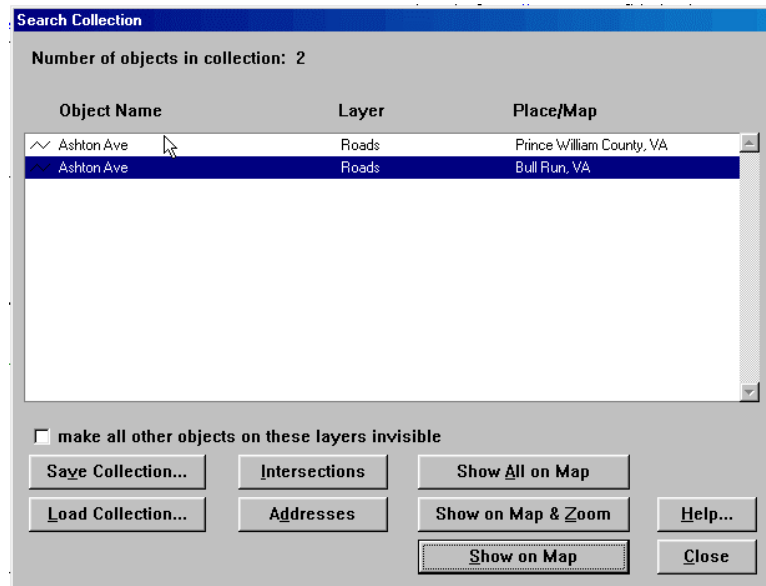


Figure 28—MARPLOT Search for Ashton Avenue

This time, our interest is in those roads intersecting with Ashton Avenue, so we use the **Intersections** button. This brings up the screen shown in Figure 29.

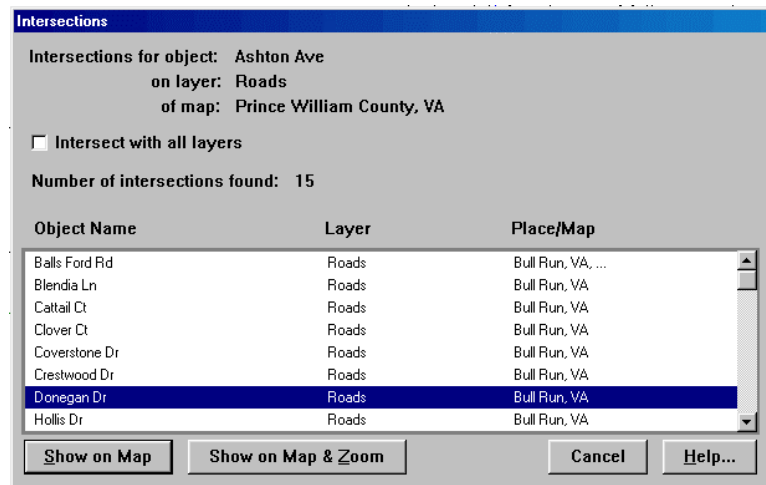


Figure 29—Donegan Road intersects with Ashton Avenue

Using **Show on Map & Zoom**, we return to the screen with the view shown in Figure 30.

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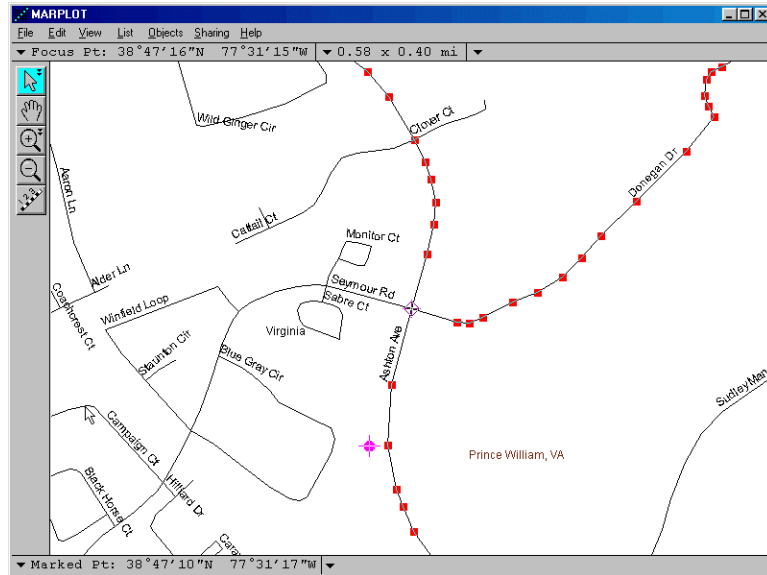


Figure 30—Donegan Road Intersects with Ashton Avenue

Notice that we now have two roads in select mode, and our map centers on the intersection of the two roads. Since we have not changed our Marked Point, it still displays the results of our previous Search.

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Lesson 4

In Lesson 4, the objectives are:

- Use LandView to examine a subset of the population
- Examine data crossing multiple jurisdictions
- Examine the extracted data as a **Thematic** map

Examining a Subset of the Population

In Lesson 2, we used Sort order to find instances of older population—those 65 years of age and older. Let us return to the theme. This time, we ask—What areas of Prince William County and its included independent Cities contain older population greater than 10% of the total population. We will want to view this data thematically in MARPLOT . We will use Census Block Groups—groupings of census blocks that show a wider range of demographic data than census blocks—as our search unit.

The data for Prince William County is separate from that of Manassas and Manassas Park, and our Find must include all three¹⁴. In LandView, each search of an additional dataset is counted as a new **Request**. However, the multiple request are folded into a single operation.

In LandView, access the data for Block Groups. We need to ‘Setup a **Find**’. This is shown in Figure 31.

¹⁴ Since the dataset includes *only* the three jurisdictions, a single search of the entire database would give the same results. However, in dealing with the state and national datasets, each jurisdictional unit would require separate identification.

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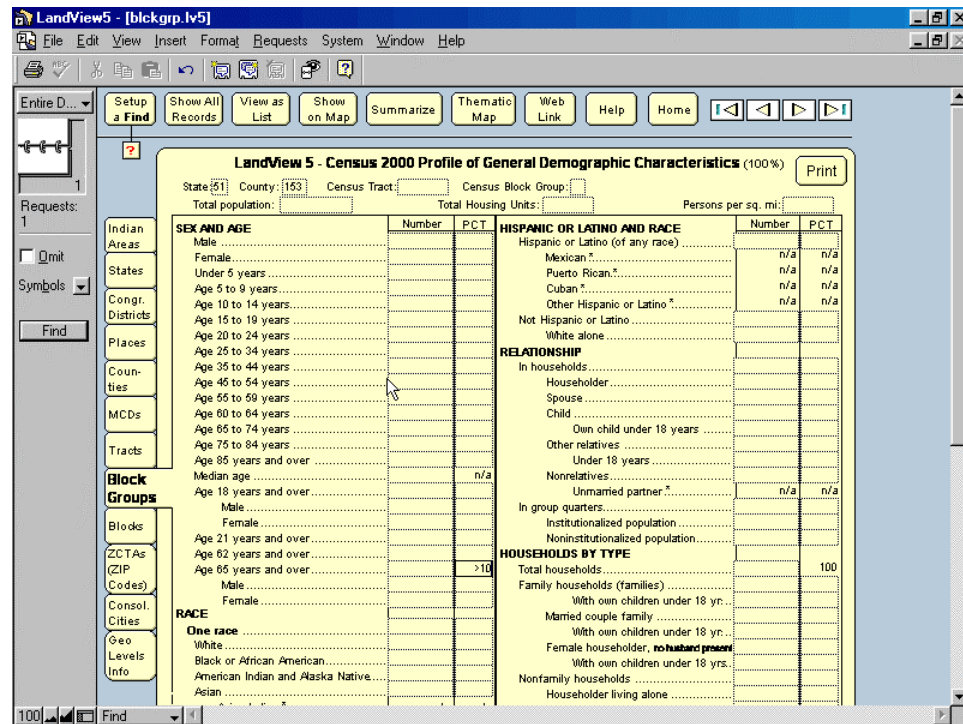


Figure 31—LandView Population Search for Age 65 Years and Older, Greater Than 10%

In the **Status Area**, this **Find** request is identified as Request No. 1. For our State and County identifiers, we have used FIPS Code designations. The substance of our Find is shown in the Percentage column for the field designator of “Age 65 years and over”. The Boolean character for ‘Greater Than’, >, can be entered from the keyboard, or it can be entered from the Symbols menu. *Do not press the Find button!* We have yet to enter our second and third requests. Use **Request/Add New Request** to open a new, blank ‘Setup a Find’ sheet. Again, we need to enter the State designation. This time, enter the FIPS Code for Manassas—683. We need to re-enter our data request for populations 65 years and older. When complete, a third request for Manassas Park—685—is necessary. Now, we can use **Find** to initiate our Search!

The results are shown in Figure 32. Out of 175 Block Groups, 19 meet our criteria. But, where are these groups, and which groups contain the very highest percentage of older people? **Thematic Mapping** provides the answers to these questions.

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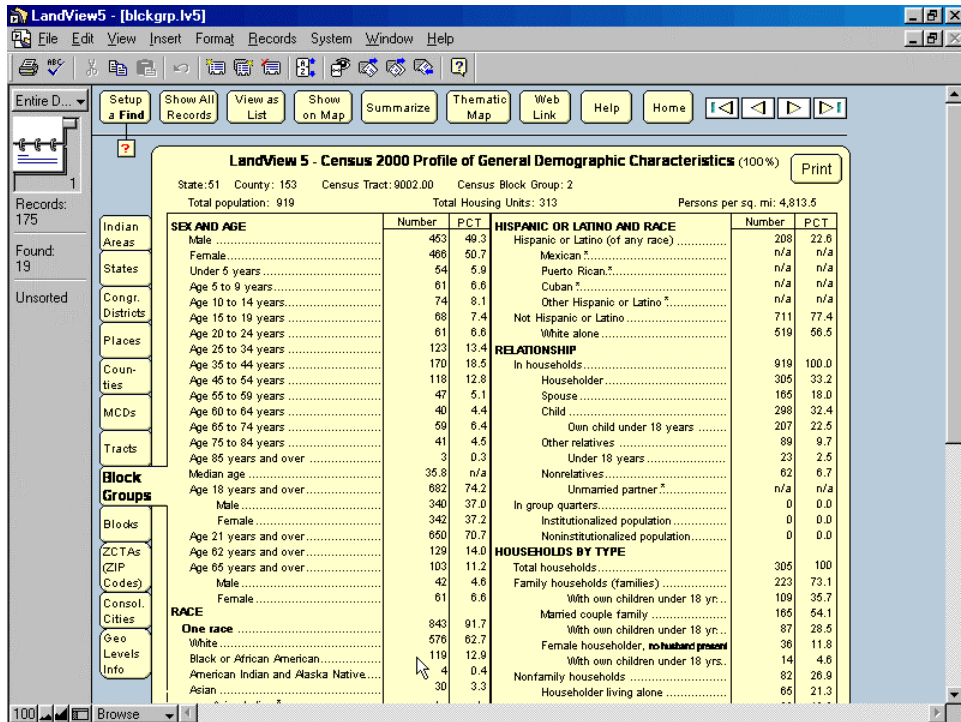


Figure 32—The Found Set for CBGs with Older Population Greater than 10%

With the **Found Set** of records displayed, first click in the data field of interest—Percentage population 65 year of age and older—and use the **Thematic Map** button. The dialogue box in Figure 33 appears.

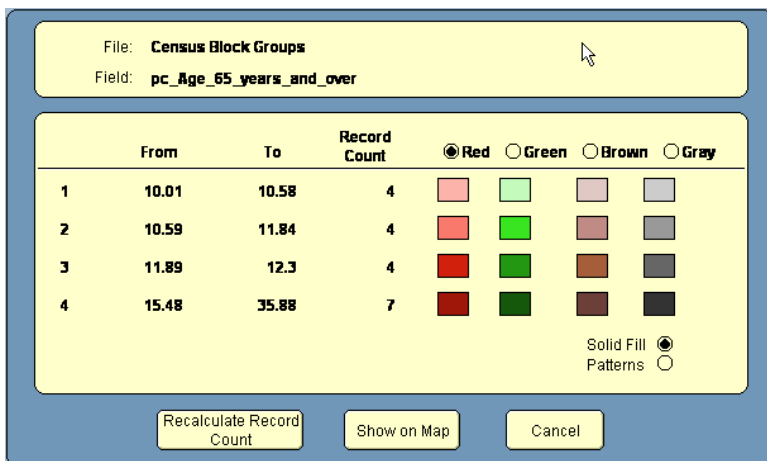


Figure 33—The Default Distribution for Thematic Mapping

Our nineteen records are divided evenly into four parts, quartiles, with the overflow going into the last quartile. The **Show on Map** button brings us to MARPLOT with only our nineteen selected Census Block Groups displayed. The Legend provides a key to the Graphics. This is shown in Figure 34.

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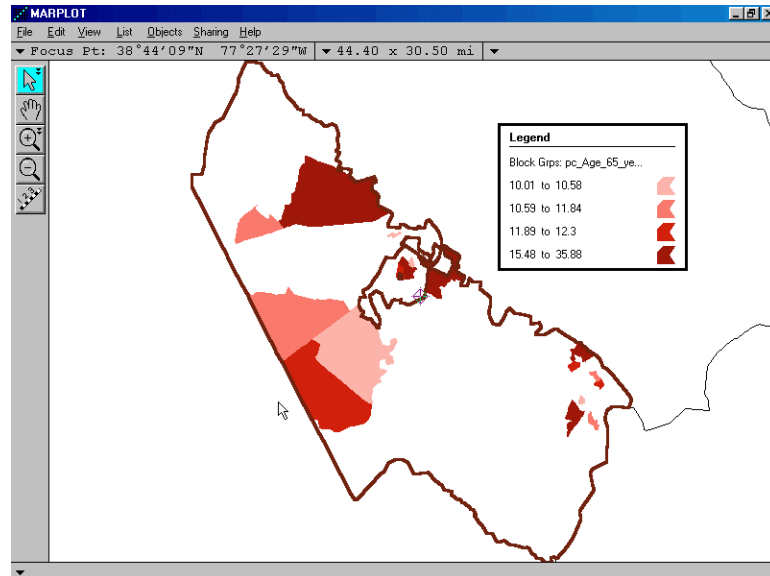


Figure 34—High Percentages of 65 Years and Older Population in PWC

While LandView does all of the work in calculating the above display, you may be more comfortable with creating number ranges to which a user may more easily relate. The range information in Figure 33 can be edited. Figure 35 displays a more meaningful set of range data. LandView needs to be told to **Recalculate Record Count** before the new distribution occurs. It is important to remember that the ranges must be continuous; otherwise data will be lost if there are breaks in the data ranges.

	From	To	Record Count	Red	Green	Brown	Gray
1	10.01	12.00	9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	12.01	15.00	3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	15.01	20.00	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	20.00	100.00	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Solid Fill ☒ Patterns ☐

Recalculate Record Count Show on Map Cancel

Figure 35—Revised Data Ranges for Thematic Display

When you are finished reviewing the map, return to LandView 5 and select the **Cancel** button in the Quartiles dialogue box. This will clear the thematic map and return you to the Census Block Group data form.

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Lesson 5

The objectives are:

- Determine the population within a radius of a mapped point
- Use MARPLOT 's **Search** to search for other mapped objects within a radius

In an earlier discussion, we pointed out that a population estimate could be initiated either from LandView or from MARPLOT . In LandView, there is the option to enter a text value for latitude and longitude. However, LandView relies on MARPLOT to identify the units of population—this at a radius about the **Focus Point**. LandView is continually aware of the location of the **Focus Point** in MARPLOT . The actual units of population captured in MARPLOT are Census Blocks.

Let us consider our Doctor's office of Lesson 3. The Doctor is aware that much of his practice comes from patients living within two miles of his Office. He is interested in how many people meet this condition.

In MARPLOT , our Marked Point is still set at the Doctor's office. Use **View/Marked Point/Center on Marked Point** to return our Focus Point to the Doctor's Office. For a visual representation of our Search, use **List/Layer List** to turn off all layers except Census Block Points and Counties. Use **View/Set Scale** to set our window distance to 6 miles. This is the view shown in Figure 36. Each mapped point represents a Census Block containing either population or housing units¹⁵. Now, we need to use LandView/MARPLOT functionality to capture this data as a population estimate.

¹⁵ One-third of the 8.2 million Census Blocks do not contain either population or housing units. These are excluded from LandView 5. Doing this conserves file space and improves mapping performance.

The LandView 5 Tutorial

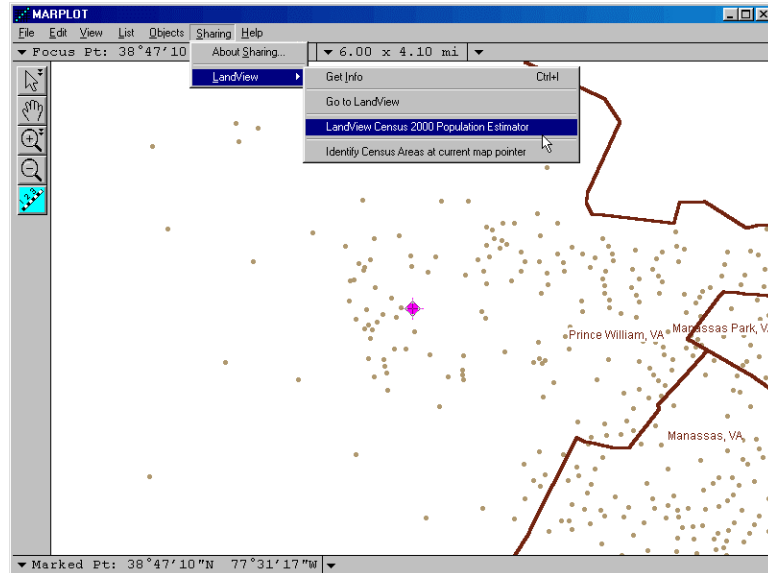


Figure 36—Census Block Distribution Prior to Accessing the Population Estimator

Use **Sharing/LandView/Census 2000 Population Estimator** to go to the work area within LandView. In LandView, we need to specify a Search radius before invoking the **Calculate Population** button. The results are displayed in Figure 37

Enter Location and Radius

Decimal degrees	Latitude: 38.786089	Longitude: 77.521339	Radius (miles): 2
or			
deg-min-sec	38 47 9	77 31 16	
hemisphere	<input checked="" type="radio"/> North <input type="radio"/> South	<input checked="" type="radio"/> West <input type="radio"/> East	<input type="button" value="Calculate Population"/>

Results (based on Census Block points located within or touching the circle defined by the radius)

Total population:	28,783	Block count:	141
Housing Units:	11,207	Area within radius:	12.566 sq. mi.

White alone:	18651
Black or African American alone:	4787
American Indian and Alaska Native alone:	130
Asian alone:	1308
Native Hawaiian and Other Pacific Islander alone:	24
Some other race alone:	2736
Two or more races:	1147
Hispanic or Latino:	4821

Figure 37—Population Statistics at a Radius of Two Miles at Doctor's Office

Shown are Total Population, Housing Units and Block Count. The calculated area of our Search circle is also displayed. The detailed information of block by block census count comes at a price—privacy! Title 13, United States Code, Section 9, prohibits the Census Bureau from publishing results in which an individual's data can be directly or indirectly identified. For this reason, the same depth of demographic data displayed for larger statistical and political units is not available for Census Block data.

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Notice the **Show This Radius on Map** button. Figure 38 shows the Search Circle in MARPLOT . It is a map object and can be used to gather additional information regarding our area of interest—road nets, schools, EPA regulated facilities, etc. The circle is contained in a special MARPLOT layer called the **LV Work Layer** in a Layer Group called **[Other]**. Like the **Temporary Layer**, also in the Group, its objects will disappear on shutdown unless other means are used to save the data. Notice, too, that our Reference Circle extends into neighboring Fairfax County, for which no data is available in this Tutorial version of LandView. If your search area extends beyond the data available in LandView/MARPLOT , you will have incomplete data, and you may draw unwarranted conclusions.

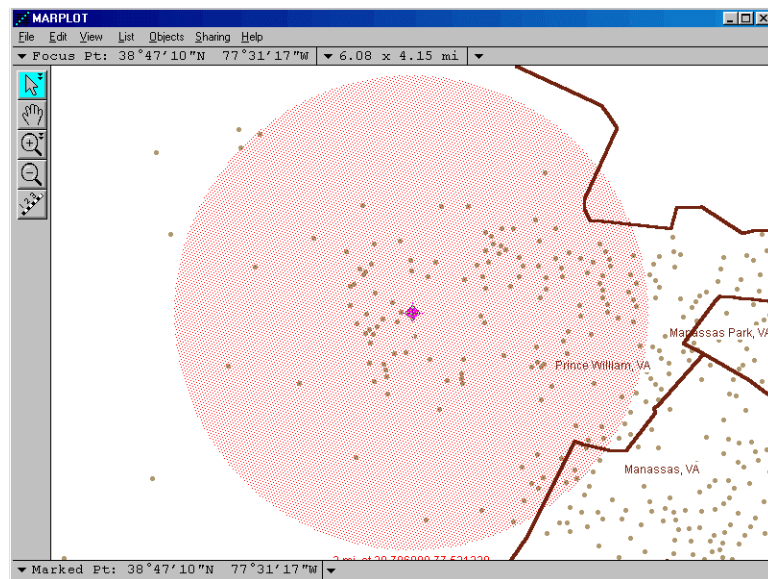


Figure 38—The Population Estimator Displays Its Search Area in MARPLOT .

More on MARPLOT Searches

MARPLOT **Search** is a particularly powerful tool. We have used it once to search for objects by name. We will now use it to search for map objects at a radius around a point. For simplicity, since we still have a **Marked Point**, we will continue to use that as our point of interest. **List/Search . . .** opens the **Search** dialogue. Figure 39 displays various methods for characterizing our search objects. Note that ellipsis indicates that that choice will open a new dialogue box in which to provide additional information.

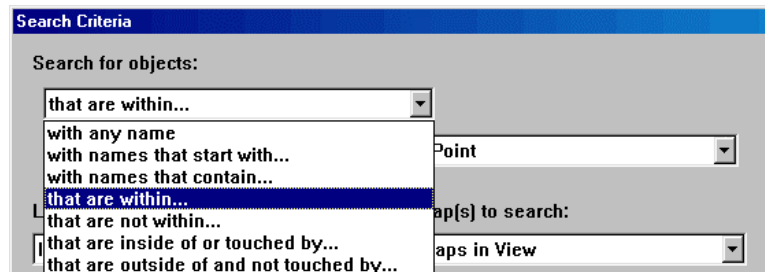


Figure 39—Search Dialogue for Radius Around a Point

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On selecting **that are within . . .** as search methodology, a new dialogue box opens asking for additional information. The information provided is shown in Figure 40.

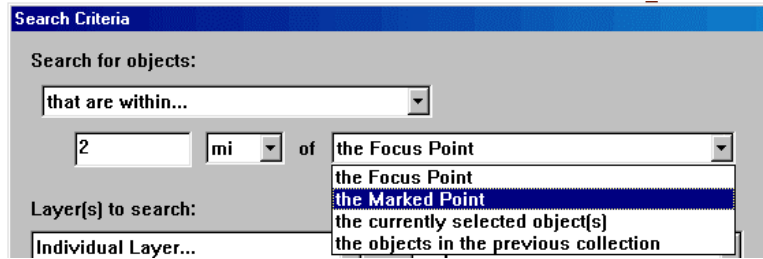


Figure 40—Further Defining the Search Criteria

As you can see, we can specify any radius, and we can specify a number of ways of defining the center points of the search. Our completely defined search is shown as Figure 41. The Search Collection resulting from the Search is shown as Figure 42.

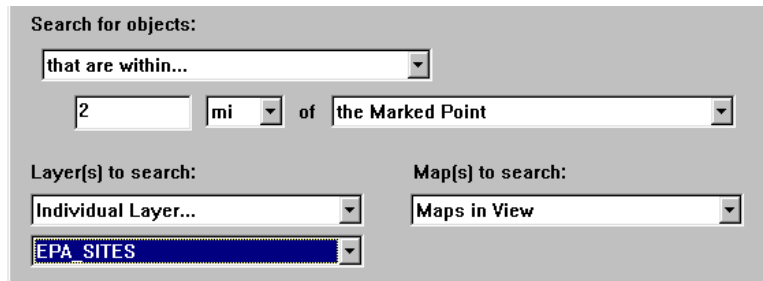
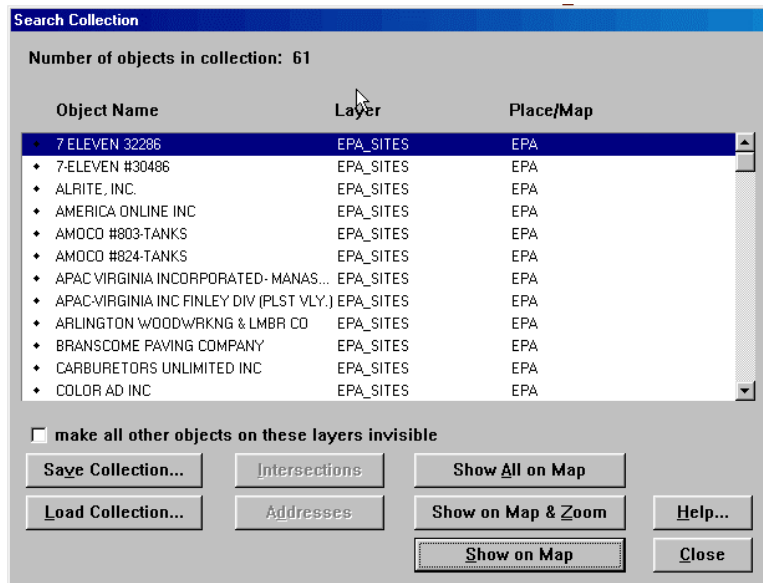


Figure 41—A MARPLOT Search Completely Defined



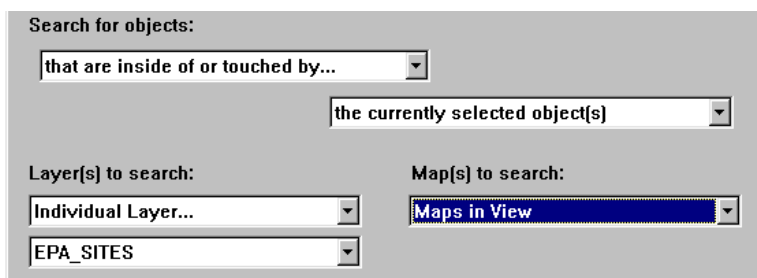
Object Name	Layer	Place/Map
7 ELEVEN 32286	EPA_SITES	EPA
7-ELEVEN #30486	EPA_SITES	EPA
ALRITE, INC.	EPA_SITES	EPA
AMERICA ONLINE INC	EPA_SITES	EPA
AMOCO #803-TANKS	EPA_SITES	EPA
AMOCO #824-TANKS	EPA_SITES	EPA
APAC VIRGINIA INCORPORATED- MANAS...	EPA_SITES	EPA
APAC-VIRGINIA INC FINLEY DIV (PLST VLY.)	EPA_SITES	EPA
ARLINGTON WOODWRKNG & LMBR CO	EPA_SITES	EPA
BRANSCOME PAVING COMPANY	EPA_SITES	EPA
CARBURETORS UNLIMITED INC	EPA_SITES	EPA
COLOR AD INC	EPA_SITES	EPA

Figure 42—The Search Collection for Figure 40

Defining a MARPLOT Search provides a number of options, and users have flexibility in defining searches. Refer back to Figure 38. Displayed is the defining area as used by the Population Estimator. This is a map object. Clicking on it places it in 'select' mode. Since

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this circle is centered on our Marked Point and since this circle has a radius equal to our search radius in the previous example, it duplicates the conditions of the previous example. We could have as easily defined the previous search as shown in Figure 43.

The image shows a search dialog box with a grey background. At the top, it says "Search for objects:". Below this are two dropdown menus. The first dropdown menu is set to "that are inside of or touched by...". The second dropdown menu is set to "the currently selected object(s)". Below these are two columns of search criteria. The left column is labeled "Layer(s) to search:" and contains two dropdown menus. The first is set to "Individual Layer..." and the second is set to "EPA_SITES". The right column is labeled "Map(s) to search:" and contains one dropdown menu set to "Maps in View".

Search for objects:

that are inside of or touched by...

the currently selected object(s)

Layer(s) to search:

Individual Layer...

EPA_SITES

Map(s) to search:

Maps in View

Figure 43—An Alternate Specification for our Previous Search

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Lesson 6

The objectives are:

- Determine the population within an irregular polygon as a map feature
- Get additional demographic data on a determined population
- Introduce the concept of Urban Area

Our LandView/MARPLOT experience centers around Census data, and our concerns are most likely to be people concerns. The final lesson in the Tutorial will explore other methods of obtaining population data and improved demographics.

Population Contained Within an Irregular Polygon

There are times when it becomes important to determine the population living within the boundaries of an irregular polygon—a school district, a fire district, etc. There are methodologies for creating such polygons, but, for the moment, our concern is using them to determine population. For this example, let us use a polygon already created for us—the **Washington DC Urbanized Area**.

Urban Areas is a Census Bureau statistical concept newly introduced into the LandView series with the publication of LandView 5. It is a precursor to enhanced demographic information for Urban Areas that will be available with the next iteration of LandView—LandView 6. In LandView 5, only the MARPLOT polygons defining urbanized areas and urban clusters are available. However, these polygons can be used in conjunction with Census Block data to determine population count and housing units within the area. For definitions and other details on urban areas go to http://www.census.gov/geo/www/ua/ua_2k.html.

Prince William County and the Cities of Manassas and Manassas Park contribute only part of their areas to the Washington DC Urbanized Area—which extends into Maryland as well as Virginia. On state CDs and the national DVD set, data will be available to calculate the entire population of an Urbanized Area. In this Demo version, we can calculate only that part of their total population these Virginia entities contribute to the Washington DC Urbanized Area.

First, let us look at Prince William County in relation to the Washington DC Urbanized Area. Use your MARPLOT skills to hide all layers except Counties and zoom in to a view that just contains both entities. This is the view shown in Figure 44. To replicate the screen, use Graphic Override (**Blue-Blue**) to change color to pink, line to heavy and fill to dots.

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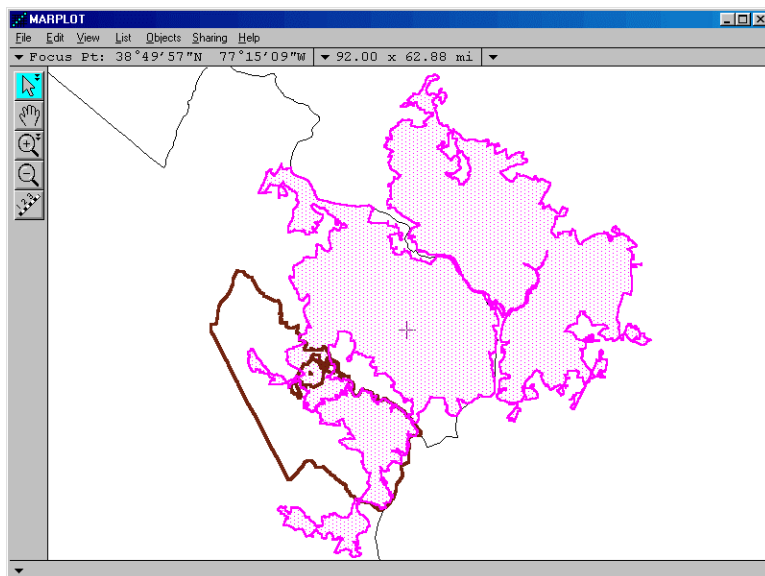


Figure 44—The Washington DC Urbanized Area overlaid on Prince William County

Place the Washington DC Urbanized Area in select mode by clicking anywhere in the polygon. We now want to search for Census Blocks contained within our polygon. Our search is shown in Figure 45 and the Search Collection in Figure 46.

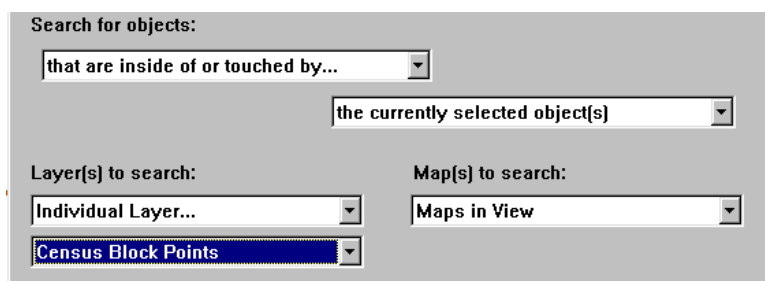


Figure 45—Block Points Inside an Irregular Polygon

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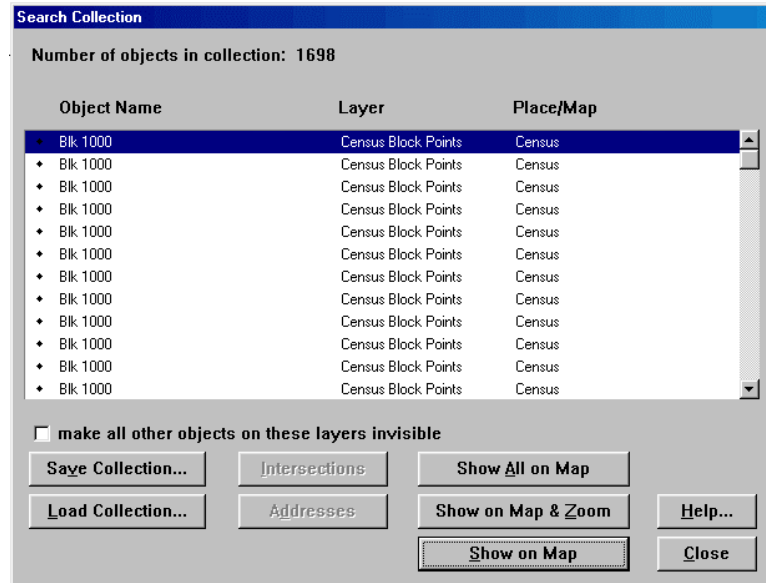


Figure 46—Census Block Points in the Search Collection

We now need to show all of the Search Collection in select mode on the map. To do this we need to use the **Show All on Map** button. With the objects in select mode in MARPLOT, we can use Sharing to ask LandView for Information. This view is shown as Figure 47.

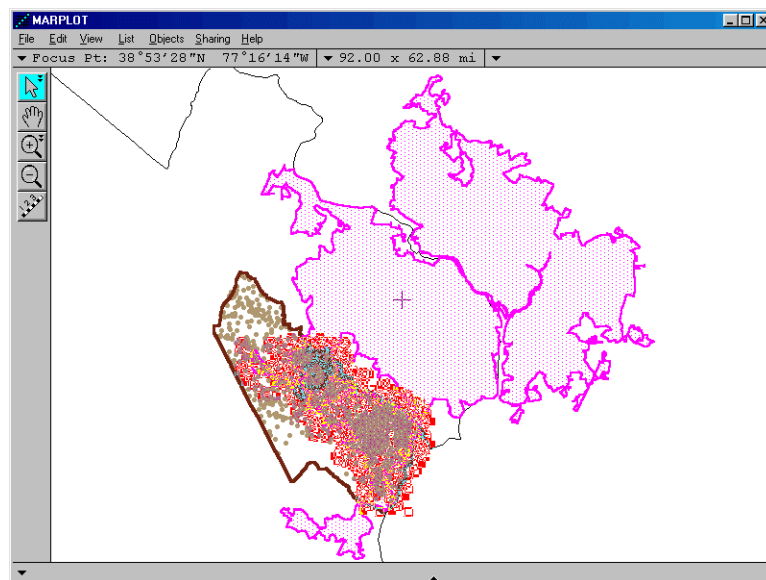


Figure 47—PWC's Contribution to the Washington Urbanized Area in Select Mode

LandView processes the request using the Census Blocks database. Results are shown in Figure 47.

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ST-CNTY-TRACT-BLOCK	Total Popul.	Housing Units	White	Black_or_African...	American_India...	Asian	Native_Hs
51-153-9014.03-1019	84.0	20.0	48.0	24.0	0.0	6.0	0.0
51-153-9014.03-1020	359.0	133.0	250.0	55.0	0.0	24.0	0.0
51-153-9014.03-1021	77.0	32.0	53.0	15.0	0.0	1.0	0.0
51-153-9014.03-1023	25.0	18.0	19.0	4.0	0.0	1.0	0.0
51-153-9014.05-2015	33.0	9.0	29.0	0.0	0.0	0.0	4.0
51-153-9014.05-2017	51.0	17.0	46.0	4.0	0.0	1.0	0.0
51-153-9014.05-2018	651.0	235.0	528.0	70.0	5.0	25.0	1.0
51-153-9014.05-2032	175.0	58.0	142.0	15.0	0.0	10.0	1.0
51-153-9014.05-2033	68.0	24.0	52.0	9.0	0.0	6.0	0.0
51-153-9014.06-1000	9.0	5.0	8.0	0.0	0.0	1.0	0.0
51-153-9014.06-1001	693.0	225.0	620.0	36.0	0.0	17.0	1.0
51-153-9014.06-1003	79.0	21.0	76.0	0.0	1.0	1.0	0.0
51-153-9014.06-1004	87.0	27.0	84.0	0.0	1.0	0.0	0.0
51-153-9014.06-1006	171.0	46.0	168.0	1.0	1.0	1.0	0.0
51-153-9014.06-1007	1,910.0	599.0	1,694.0	93.0	3.0	66.0	0.0
51-153-9014.06-1008	167.0	50.0	157.0	9.0	0.0	1.0	0.0
51-153-9014.06-1009	365.0	109.0	317.0	21.0	2.0	12.0	0.0
51-153-9014.06-1010	10.0	5.0	10.0	0.0	0.0	0.0	0.0
51-153-9014.06-1011	224.0	77.0	194.0	21.0	0.0	7.0	2.0
51-153-9014.06-1012	387.0	135.0	361.0	15.0	0.0	5.0	0.0
51-153-9014.06-1014	94.0	32.0	83.0	11.0	0.0	0.0	0.0
51-153-9014.06-1015	19.0	7.0	14.0	5.0	0.0	0.0	0.0
51-153-9014.06-1017	22.0	8.0	21.0	1.0	0.0	0.0	0.0
51-153-9014.06-1018	51.0	22.0	44.0	7.0	0.0	0.0	0.0

Figure 48—LandView Display of the Get Information Request from MARPLOT

What we see in Figure 48 is a table of records for each of the Census Block Points contained within our irregular polygon. To reduce this to meaningful data, there is a **Summarize** button. Invoking **Summarize** results in the display screen shown in Figure 49.

population	housing units	white	black	indian	asian	pacific	other	multi_race	hispanic
300,479	104,368	203,295	56,759	1,185	11,997	392	15,613	11,238	33,513

Figure 49—Prince William County, Manassas and Manassas Park's Contribution to Washington UA

The above demonstrated method for population search has general applicability. Any MARPLOT map objects linked to information attributes in LandView can be captured in a Search, and its LandView data component can be examined. We could, as well, have searched for EPA regulated sites within the Washington DC Urbanized Area. If so, our first LandView record would appear as Figure 50.

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The screenshot shows the LandView 5 software interface. The title bar reads 'LandView5 - [epasites.lv5]'. The menu bar includes File, Edit, View, Insert, Format, Records, System, Window, and Help. The toolbar contains icons for various functions. The main window displays 'Environmental Protection Agency Database Information Extracted From "ENVIROFACTS" (www.epa.gov/enviro - extracted August, 2001)'. The left sidebar shows 'Form View', 'Records: 368', 'Found: 303', and 'Unsorted'. The main content area is divided into several sections: 'FACILITY IDENTIFICATION' with fields for Name (7 ELEVEN 32286), Address (8375 SUDLEY RD, MANASSAS, VA 22110), SIC, EPA ID (000006992394), State-County Code (51153), Latitude (+38.774558), and Longitude (-77.501950); 'EPA SYSTEMS' with checkboxes for RCRAInfo (Hazardous Waste), PCS (Wastewater Discharges), TRI (Toxic Release Inventory), AIRS/AQS (Air Releases), and CERCLIS (Superfund Sites); and 'CHEMICALS (AIRS, PCS, TRI only)' with a table for Code, Chemical or Parameter Name, and Database.

Figure 50—A USEPA Site within the Washington DC Urbanized Area

To Obtain Demographic Data, Use Census Block Groups

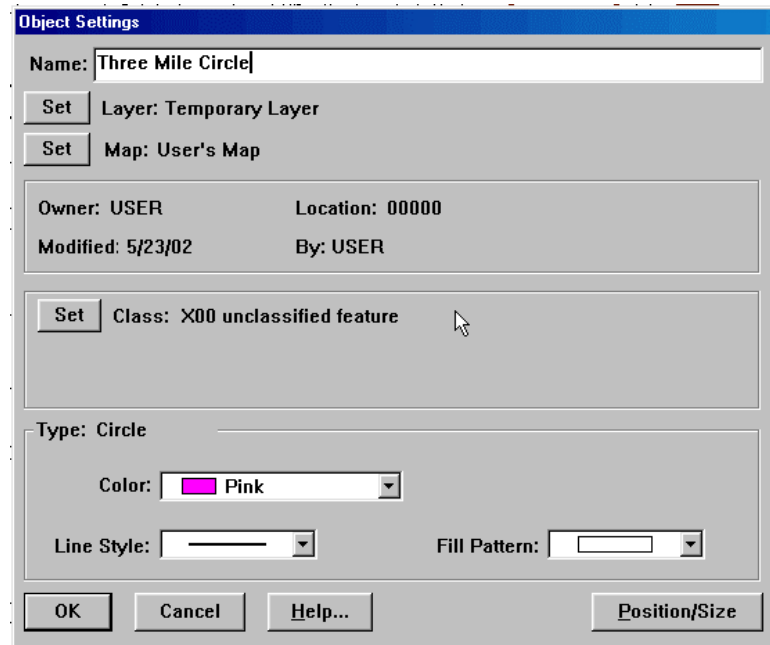
As previously stated, only limited demographic data is associated with Census Block Points. However, there are times when we wish to obtain a broader demographic profile of a mapped area. Most appropriate to this end is the use of Census Block Groups¹⁶. Consider the following scenario:

A merchant plans to open a new retail outlet at the corner of Dale Boulevard and Hoadly Road in Dale City, Virginia (in PWC). Most of his customers will live within a three mile radius of his establishment. He wishes to know the demographic makeup of the community.

To start, we need to do some preparation. We need to locate the intersection of Dale Boulevard and Hoadly Road. To do this, we will use **Search**. Once found, **Mark** the point for easy retrieval. We also need to create a new map object—a reference circle. In **List/Layer List . . .**, unlock the **Temporary** layer contained in the **[Other]** group. On returning to the map screen, we see that map drawing tools are now available to us. Set our map scale to a window distance of 10 miles. Use the Circle tool, , to draw a circle from the Marked Point to a radius of three miles. On releasing the mouse, a dialogue box appears. MARPLOT wants information about your new map object. An annotated dialogue box appears in Figure 51.

¹⁶ A close examination of the data displays for Block Groups and Tracts in LandView will show that not all data fields implemented in Tracts are available at the Block Group level.

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51—The Object Setting Dialogue Box for the Reference Circle

We can identify our object as “Three Mile Circle”. It is on the **Temporary Layer** (Objects on the Temporary Layer disappear on exiting from MARPLOT¹⁷) and the **User’s Map**. Specify the **Color** as Pink, the **Line Style** as ‘double’ and the **Fill Pattern** as ‘empty’. An **OK** returns us to the map screen shown in Figure 52 with the Reference Circle still in select mode.

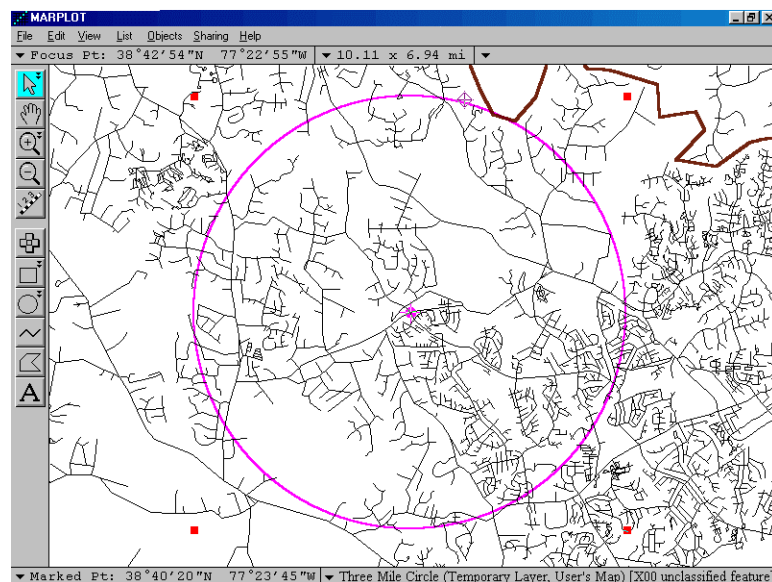


Figure 52—Reference Circle around Dale Boulevard and Hoadly Road

¹⁷ Objects can be moved from a temporary layer to a permanent layer if both layers are unlocked. Place the objects in select mode and use the **Objects/Move objects to layer . . .** menu.

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To search for Census Block Groups, we need to go to **List/Layer List . . .** to hide the Roads layers and place the Census Block Group layer in Show mode. On return to the map screen, our display is as shown in Figure 53.

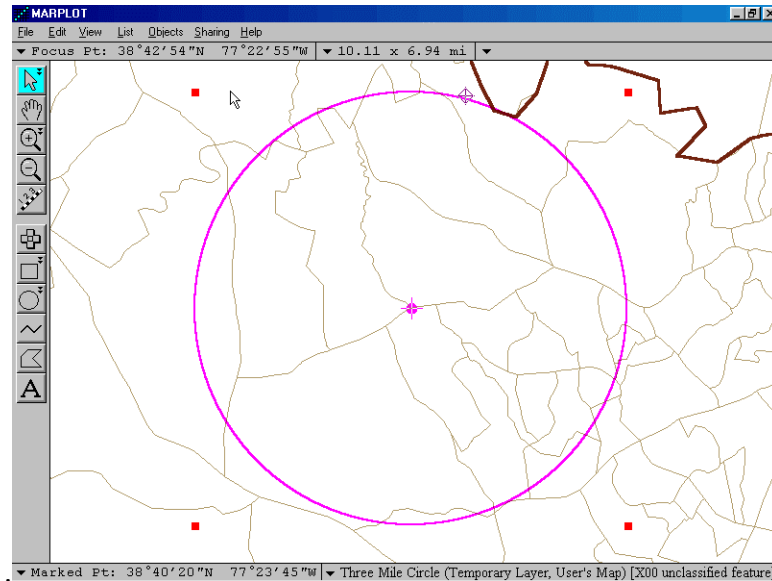


Figure 53—Census Block Groups Displayed as Unfilled Polygons

Since polygon selection is easier using filled polygons, return to **List/Layer List** to place the Census Block Group layer in **Graphic Override** mode (**Blue-Blue**) and use the **Set (Default Graphics)** to set the fill pattern to a crosshatched selection. When we return to the screen, our view will appear as in Figure 54.

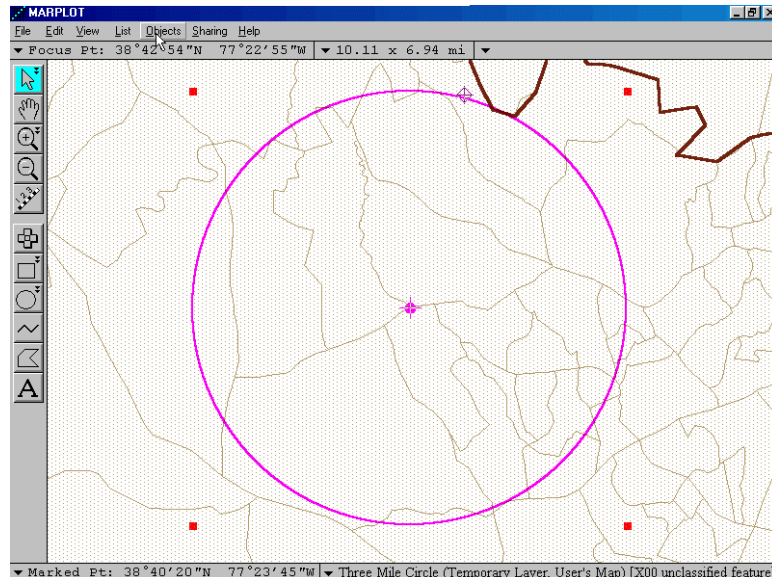


Figure 54—Census Block Groups as Filled Polygons

We will now use our reference circle to ‘capture ‘ those Census Block Groups that are inside of or touched by our reference circle. Our search is shown in Figure 55.

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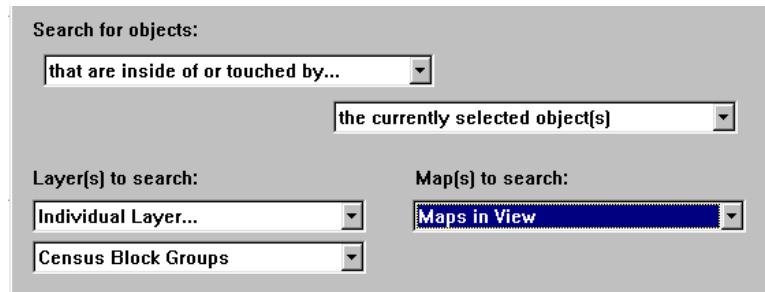


Figure 55—Identifying the CBGs Touched By the Reference Circle

We will use the **Show All on Map** option to display the Search Collection. This view is shown in Figure 56.

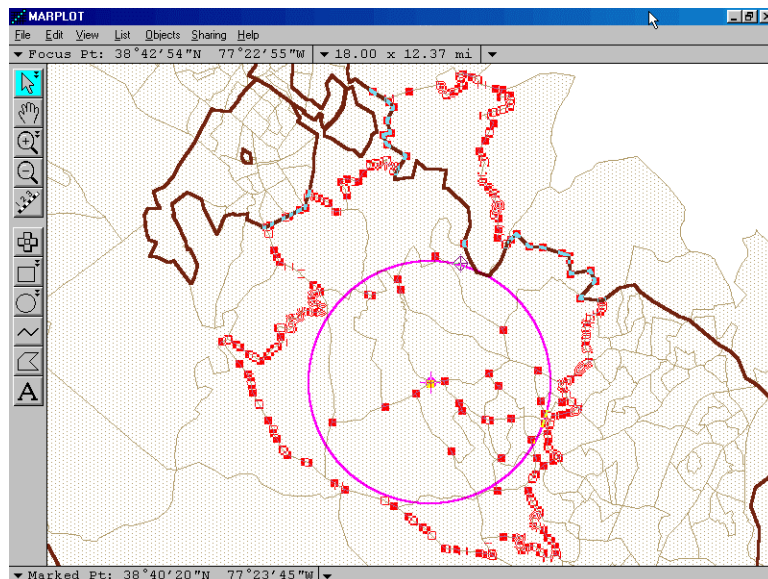


Figure 56—CBGs Inside Of or Touched By the Reference Circle.

As can be seen in Figure 56, the selected CBGs greatly exceed the area of our reference circle. To obtain a more meaningful answer, we will use a modification of a search technique called **Centroid Capture**. A centroid is a centroid of area. In theory, if a centroid is captured, more than 50% of the area lies within the capture. If a centroid is not captured, more than 50% of the area lies outside the capture. As we do not have centroids, we will do this visually. By holding down the **[Shift]** key while selecting or deselecting, we can selectively remove Census Block Groups that do not contribute half their area to the reference circle. Using this technique, we have the revised view of Figure 56 that is shown in Figure 57.

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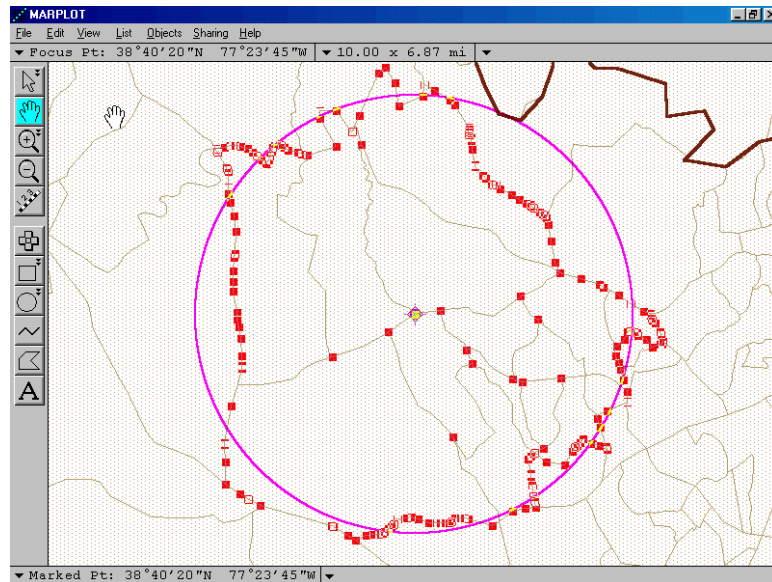


Figure 57—[Shift]-Select used to Deselect Appropriate CBGs

In Figure 57, we have a selection of Census Block Groups which closely represent those contained within our reference circle. We can use these to get a close approximation for the demographics of population at our desired radius of three miles. Use **Sharing/LandView/Get Info** to get Census Block Group data on the selected objects. Again, we need to use the **Summarize** button to sum up the individual records in the Found Set. A partial printout of the data is shown as Figure 58.

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LandView 5 - Census 2000 Profile of General Demographic Characteristics					
Summary of Census Block Groups			# records summarized 15		
Total population 33,808		Total Housing Units 10,218		Persons per sq. mi: 1,375.5	
SEX AND AGE	Number	PCT	HISPANIC OR LATINO AND RACE	Number	PCT
Male	16,853	49.8	Hispanic or Latino (of any race)	2,480	7.3
Female	16,955	50.2	Mexican	0	0.0
Under 5 years	2,484	7.3	Puerto Rican	0	0.0
Age 5 to 9 years	3,184	9.4	Cuban	0	0.0
Age 10 to 14 years	3,475	10.3	Other Hispanic or Latino	0	0.0
Age 15 to 19 years	3,047	10.3	Not Hispanic or Latino	31,328	92.7
Age 20 to 24 years	1,564	4.6	White alone	21,408	63.3
Age 25 to 34 years	4,130	12.2	RELATIONSHIP		
Age 35 to 44 years	6,988	20.7	In households	33,743	99.8
Age 45 to 54 years	5,438	16.1	Householder	10,012	29.6
Age 55 to 59 years	1,581	4.7	Spouse	7,739	22.9
Age 60 to 64 years	839	2.5	Child	12,804	37.9
Age 65 to 74 years	752	2.2	Own child under 18 years	10,221	30.2
Age 75 to 84 years	264	0.8	Other relatives	1,977	5.8
Age 85 years and over	62	0.2	Under 18 years	780	2.3
Median age	n/a	n/a	Nonrelatives	1,211	3.6
Age 18 years and over	22,567	66.8	Unmarried partner	0	0.0
Male	11,152	33.0	In group quarters	65	0.2
Female	11,415	33.8	Institutionalized population	65	0.2
Age 21 years and over	21,281	62.9	Noninstitutionalized population	0	0.0
Age 62 years and over	1,529	4.5	HOUSEHOLDS BY TYPE		
Age 65 years and over	1,078	3.2	Total households	10,012	100
Male	476	1.4	Family households (families)	8,930	89.2
Female	602	1.8	With own children under 18 yr. ..	5,272	52.7
RACE			Married couple family	7,739	77.3
One race	32,553	96.3	With own children under 18 yr. ..	4,503	45.0
White	22,485	66.5	Female householder, no husband present ..	835	8.3
Black or African American	7,482	22.1	With own children under 18 yrs. ..	564	5.6
American Indian and Alaska Native	111	0.3	Nonfamily households	1,082	10.8
Asian	1,396	4.1	Householder living alone	724	7.2
Asian Indian	n/a	0	Householder 65 years and over	109	1.1
Chinese	n/a	0.0	Households with own children under 18 years ..	5,605	56.0

Figure 58—Demographic data at a Radius around a Point.

Where Do You Go From Here

This concludes the LandView Tutorial. During the six lessons, we covered the major features and functions of the LandView 5 product.

As stated at the start of the Tutorial, users should look at the MARPLOT User's Guide for examples of more advanced MARPLOT mapping features as well as refer to the LandView 5 and MARPLOT Help systems for more detailed explanations of specific program features.

Users are encouraged to visit our LandView Help page and provide comments and other feedback that can be incorporated into future versions of this Tutorial. You can access the LandView Help page by clicking on the Help button on the LandView 5 Startup menu.

Source: U.S. Census Bureau, Geography Division

Updated: 8/15/02